Appendix A

State Reuse Regulations and Guidelines

Table A-1. Unrestricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates [1]	Groundwater Monitoring [1]	Setback Distances [1] [2]	Other
Arizona	*Class A reclaimed water:* • Secondary treatment, filtration and disinfection • Chemical feed facilities required to add coagulants or polymers if necessary to meet turbidity criterion • Turbidity - 2 NTU (24 hour average) – 5 NTU (not to exceed at any time) • Fecal coliform - none detectable in 4 of last 7 daily samples - 23/100 ml (single sample maximum) *Class B reclaimed water:* • Secondary treatment and disinfection • Fecal coliform - 200/100 ml (not to exceed in 4 of the last 7 daily samples) - 800/100 ml	• Case-by-case basis			• Application rates based on either the water allotment assigned by the Arizona Department of Water Resources (a water balance that considers consumptive use of water by the crop, turf, or landscape vegetation) or an alternative approved method			• Class A reclaimed water may be used for residential landscape irrigation, schoolground landscape irrigation, toilet and urinal flushing, fire protection systems, commercial closed-loop air conditioning systems, vehicle and equipment washing, and snowmaking • Class B reclaimed water may be used for landscape impoundment, construction uses, and street cleaning • Application methods that reasonably preclude human contact with reclaimed water will be used when irrigating

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	(single sample maximum)							
Arkansas	• Secondary treatment and disinfection	• As required by regulatory agency		• Based on water balance using divisional average annual 90 percentile rainfall	• Hydraulic - 0.5 to 4.0 in/wk • Nitrogen - percolate nitrate-nitrogen not to exceed 10 mg/l	• Required • One well upgradient • One well within site • One well down- gradient • More wells may be required on a case-by-case basis	• Determined on a case-by-case basis	
California	• Disinfected tertiary recycled water -oxidized, coagulated (not required if membrane filtration is used and/or turbidity requirements are met), filtered, disinfected • Total coliform - 2.2/100 ml (7-day median) - 23/100 ml (not to exceed in more than one sample in any 30-day period) - 240/100 ml (maximum any one sample)	• Total coliform - sampled at least once daily from the disinfected effluent • Turbidity - continuously sampled following filtration	• Warning alarms • Back-up power source • Multiple treatment units capable of treating entire flow with one unit not in operation or storage or disposal provisions • Emergency storage or disposal: short-term, 1 day; long-term, 20 days • Sufficient number of qualified personnel				• No irrigation within 50 feet of any domestic water supply well unless certain conditions are met	• Includes landscape irrigation of parks, playgrounds, schoolyards, residential lawns, and unrestricted access golf courses, as well as use in decorative fountains • Also allows reclaimed water use for toilet and urinal flushing, fire protection, construction uses, and commercial car washing

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	• Turbidity requirements for wastewater that has been coagulated and passed through natural undisturbed soils or a bed of filter media - maximum average of 2 NTU within a 24-hour period - not to exceed 5 NTU more than 5 percent of the time within a 24-hour period - maximum of 10 NTU at any time • Turbidity requirements for wastewater passed through membrane - not to exceed 0.2 NTU more than 5 percent of the time within a 24-hour period - maximum of 0.5 NTU at any time							

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Colorado	*Landscape irrigation excluding single-family residential:* • Oxidized, filtered and disinfected • E. coli - 126/100 ml (monthly average) - 235/100 ml (single sample maximum in any calendar month) • Turbidity - not to exceed 3 NTU (monthly average) - not to exceed 5 NTU in more than 5 percent of the individual analytical results (any calendar month) *Single-family residential:* • Oxidized, coagulated, clarified, filtered, and disinfected • Total coliform - 2.2/100 ml (7-day median)	*Treaters:* • Quality of reclaimed domestic wastewater produced and delivered at the point of compliance *Applicators:* • Total volume of reclaimed domestic wastewater applied per year or season • The maximum monthly volume applied • Each location with the associated acreage where reclaimed domestic wastewater was applied			• Application rates shall protect surface and groundwater quality and irrigation shall be controlled to minimize ponding		*Landscape irrigation excluding single-family residential:* • No impoundment or irrigation of reclaimed water within 100 feet of any well used for domestic supply unless, in the case of impoundment, it is lined with a synthetic material with a permeability of 10^{-6} cm/sec or less *Single-family residential:* • No irrigation of reclaimed water within 500 feet of any domestic supply well • No irrigation of reclaimed water within 100 feet of any irrigation well	

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	- 23/100 ml (any sample)							
Delaware	• Advanced treatment using oxidation, clarification, coagulation, flocculation, filtration, and disinfection • 10 mg/l BOD_5 • 10 mg/l TSS • Turbidity not to exceed 5 NTU • Fecal coliform - 20/100 ml	• Continuous on-line monitoring for turbidity before application of the disinfectant • Continuous on-line monitoring of residual disinfection concentrations • Parameters which may require monitoring include volume of water applied to spray fields, BOD, suspended solids, fecal coliform bacteria, pH, COD, TOC, ammonia nitrogen, nitrate nitrogen, total Kjeldahl nitrogen, total phosphorus, chloride, Na, K, Ca, Mg, metals, and priority pollutants • Parameters		• Storage provisions required either as a separate facility or incorporated into the pretreatment system • Minimum 15 days storage required unless other measures for controlling flow are demonstrated • Must determine operational, wet weather, and water balance storage requirements • Separate off-line system for storage of reject wastewater with a minimum capacity equal to 2 days average daily design flow required	• Maximum design wastewater loadings limited to 2.5 in/wk • Maximum instantaneous wastewater application rates limited to 0.25 in/hour • Design wastewater loading must be determined as a function of precipitation, evapotrans-piration, design percolation rate, nitrogen loading and other constituent loading limitations, groundwater and drainage conditions, and average and peak design wastewater flows and seasonal fluctuations	• Required • One well upgradient of site or otherwise outside the influence of the site for background monitoring • One well within wetted field area of each drainage basin intersected by site • Two wells downgradient in each drainage basin intersected by site • One well upgradient and One well downgradient of the pond treatment and storage facilities in each drainage basin intersected by site • May require measurement of depth to groundwater,	• Determined on a case-by-case basis	• Regulations pertain to sites unlimited to public access

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		and sampling frequency determined on case-by-case basis				pH, COD, TOC, nitrate nitrogen, total phosphorus, electrical conductivity, chloride, fecal coliform bacteria, metals, and priority pollutants • Parameters and sampling frequency determined on a case-by-case basis		
Florida	• Secondary treatment with filtration and high-level disinfection • Chemical feed facilities to be provided • 20 mg/l $CBOD_5$ (annual average) • 5 mg/l TSS (single sample) to be achieved prior to disinfection • Total chlorine residual of at least 1 mg/l after a minimum	• Parameters to be monitored and sampling frequency to be identified in wastewater facility permit • Minimum schedule for sampling and testing based on system capacity established for flow, pH, chlorine residual, dissolved oxygen, suspended solids, $CBOD_5$, nutrients, and	• Class I reliability - requires multiple or back-up treatment units and a secondary power source • Minimum reject storage capacity equal to 1-day flow at the average daily design flow of the treatment plant or the average daily permitted flow of the reuse system, whichever is	• At a minimum, system storage capacity shall be the volume equal to 3 times the portion of the average daily flow for which no alternative reuse or disposal system is permitted • Water balance required with volume of storage based on a 10-year recurrence interval and a minimum of 20	• Site specific • Design hydraulic loading rate - maximum annual average of 2 in/wk is recommended • Based on nutrient and water balance assessments	• Required • One upgradient well located as close as possible to the site without being affected by the site's discharge (background well) • One well at the edge of the zone of discharge down-gradient of the site (compliance well) • One well downgradient	• 75 feet to potable water supply wells • 75 feet from reclaimed water transmission facility to public water supply well • Low trajectory nozzles required within 100 feet of outdoor public eating, drinking, and bathing facilities • 100 feet from indoor aesthetic	• Includes use of reclaimed water for irrigation of residential lawns, golf courses, cemeteries, parks, playgrounds, schoolyards, highway medians, and other public access areas • Also includes use of reclaimed water for toilet flushing, fire protection, construction

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State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates [1]	Groundwater Monitoring [1]	Setback Distances [1] [2]	Other
	acceptable contact time of 15 minutes at peak hourly flow • Fecal coliform - over 30 day period, 75 percent of samples below detection limits - 25/100 ml (single sample) • pH 6 - 8.5 • Limitations to be met after disinfection	fecal coliform • Continuous on-line monitoring of turbidity prior to disinfection • Continuous on-line monitoring of total chlorine residual or residual concentrations of other disinfectants • Monitoring for *Giardia* and *Cryptosporidium* based on treatment plant capacity - ≥ 1 mgd, sampling one time during each 2-year period - < 1 mgd, sampling one time during each 5-year period - samples to be taken immediately following disinfection process • Primary and secondary drinking water standards to	less • Minimum system size of 0.1 mgd (not required for toilet flushing and fire protection uses) • Staffing - 24 hrs/day, 7 days/wk or 6 hrs/day, 7 days/wk with diversion of reclaimed water to reuse system only during periods of operator presence	years of climatic data • Not required if alternative system is incorporated into the system design to ensure continuous facility operation • Existing or proposed lakes or ponds (such as golf course ponds) are appropriate for storage if it will not impair the ability of the lakes or ponds to function as a stormwater management system • Aquifer storage and recovery allowed as provision of storage		from the site and within the zone of discharge (intermediate well) • One well located adjacent to unlined storage ponds or lakes • Other wells may be required depending on site-specific criteria • Quarterly monitoring required for water level, nitrate, total dissolved solids, arsenic, cadmium, chloride, chromium, lead, fecal coliform, pH, and sulfate • Monitoring may be required for additional parameters based on site-specific conditions and groundwater quality	features using reclaimed water to adjacent indoor public eating and drinking facilities • 200 feet from unlined storage ponds to potable water supply wells	dust control, vehicle washing and aesthetic purposes • Tank trucks can be used to apply reclaimed water if requirements are met • Cross-connection control and inspection program required

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		be monitored by facilities ≥ 100,000 gpd				quality		
Georgia	• Secondary treatment followed by coagulation, filtration, and disinfection • 5 mg/l BOD • 5 mg/l TSS • Fecal coliform - 23/100 ml (monthly average) - 100/100 ml (maximum any sample) • pH 6 - 9 • Turbidity not to exceed 3 NTU prior to disinfection • Detectable disinfectant residual at the delivery point	• Continuous turbidity monitoring prior to disinfection • Weekly sampling for TSS and BOD • Daily monitoring for fecal coliform • Daily monitoring for pH • Detectable disinfection residual monitoring	• Multiple process units • Ability to isolate and bypass all process units • System must be capable of treating peak flows with the largest unit out of service • Equalization may be required • Back-up power supply • Alarms to warn of loss of power supply, failure of pumping systems, failure of disinfection systems, or turbidity greater than 3 NTU	• Reject water storage equal to at least 3 days of flow at the average daily design flow • One of the following options must be in place to account for wet weather periods - sufficient storage onsite or at the customer's location to handle the flows until irrigation can be resumed - additional land set aside that can be irrigated without causing harm to the cover crop - obtain NPDES permit for all or part of the flow			• Determined on a case-by-case basis	
Hawaii	*R-1 water:*	• Daily flow	• Multiple or	• 20 days	• Design	• Required	*R-1 water:*	• R-1 water can

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	• Oxidized, filtered, and disinfected • Fecal coliform – 2.2/100 ml (7-day median) - 23/100 ml (not to exceed in more than one sample in any 30-day period) - 200/100 ml (maximum any one sample) • Inactivation and/or removal of 99.999 percent of the plaque-forming units of F-specific bacteriophage MS2, or polio virus • Effluent turbidity not to exceed 2 NTU • Chemical pretreatment facilities required in all cases where granular media filtration is used; not required for facilities using membrane filtration	monitoring • Continuous turbidity monitoring prior to and after filtration process • Continuous measuring and recording of chlorine residual • Daily monitoring of fecal coliform • Weekly monitoring of BOD_5 and suspended solids	standby units required with sufficient capacity to enable effective operation with any one unit out of service • Alarm devices required for loss of power, high water levels, failure of pumps or blowers, high head loss on filters, high effluent turbidity, loss of coagulant or polymer feed, and loss of chlorine residual • Standby power source required for treatment plant and distribution pump stations	storage required unless it can be demonstrated that another time period is adequate or that no storage is necessary • Storage requirements based on water balance using at least a 30-year record • Reject storage required with a volume equal to 1 day of flow at the average daily design flow • Emergency system storage not required where an alternate effluent disposal system has been approved	application rate determined by water balance	• Groundwater monitoring system may consist of a number of lysimeters and/or monitoring wells depending on site size, site characteristics, location, method of discharge, and other appropriate considerations • One well upgradient and two wells downgradient for project sites 500 acres or more • One well within the wetted field area for each project whose surface area is greater than or equal to 1,500 acres • One lysimeter per 200 acres • One lysimeter for project sites that have greater than 40 but less than	• Minimum of 50 feet to drinking water supply well • Outer edge of impoundment at least 100 feet from any drinking water supply well *R-2 water:* • For spray irrigation applications, 500 feet to residence property or a place where public exposure could be similar to that at a park, elementary school yard or athletic field • Minimum of 100 feet to any drinking water supply well • Outer edge of impoundment at least 300 feet from any drinking water supply well	be used for spray Irrigation of golf courses, parks, elementary schoolyards, athletic fields, landscapes around some residential property, roadside and median landscapes, landscape impoundments with decorative fountain, and decorative fountains • R-1 water can also be used for flushing toilets and urinals, fire fighting and washing yards, lots and sidewalks • R-2 water can be used as source of supply for landscape impoundments without decorative fountain and construction uses

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	• Theoretical chlorine contact time of 120 minutes and actual modal contact time of 90 minutes throughout which the chlorine residual is 5 mg/l *R-2 water:* • Oxidized and disinfected • Fecal coliform – 23/100 ml (7-day median) - 200/100 ml (not to exceed in more than one sample in any 30-day period) • Theoretical chlorine contact time of 15 minutes and actual modal contact time of 10 minutes throughout which the chlorine residual is 0.5 mg/l					200 acres • Additional lysimeters may be necessary to address concerns of public health or environmental protection as related to variable characteristics of the subsurface or of the operations of the project		• If alternative application methods are used, such as subsurface, drip or surface irrigation, a lesser quality reclaimed water may be suitable • R-2 water used in spray irrigation will be performed during periods when the area is closed to the public and the public is absent from the area, and end at least 1 hour before the area is open to the public • Subsurface irrigation may be performed at any time
Idaho	• Oxidized,							• Includes

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	coagulated, clarified, filtered, and disinfected • Total coliform - 2.2/100 ml (7-day median)							irrigation of parks, playgrounds, schoolyards and other areas where children are more likely to have access or exposure • Irrigation to be accomplished during periods of non-use
Illinois	• Two-cell lagoon system with tertiary sand filtration and disinfection or mechanical secondary treatment with disinfection			• Minimum storage capacity equal to at least 150 days of wastewater at design average flow except in southern Illinois areas where a minimum of 120 days of storage capacity to be provided • Storage can be determined based on a rational design that must include capacity for the wettest year with a 20-year	• Based on the limiting characteristic of the treated wastewater and the site • Balances must be calculated and submitted for water, nitrogen, phosphorus, and BOD	• Required • One well upgradient for determining background concentrations • Two wells downgradient in the dominant direction of groundwater movement • Wells between each potable water well and the application area if within 1,000 feet • Monitoring of nitrates, ammonia nitrogen, chlorides, sulfates, pH, total dissolved	• 200 feet to residential lot lines	

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				return frequency		solids, phosphate, and coliform bacteria		
Indiana	• Secondary treatment and disinfection • 10 mg/l BOD_5 • 5 mg/l TSS prior to disinfection (24 hour average) • Fecal coliform - no detectable fecal coliform (7-day median) – 14/100 ml (single sample) • pH 6 - 9 • Total chlorine residual after a minimum contact time of 30 minutes at least 1 mg/l (if chlorination is used for disinfection)	• Daily monitoring of TSS, coliform, and chlorine residual • Weekly monitoring of BOD and pH • Monthly monitoring of total nitrogen, ammonium nitrogen, nitrate nitrogen, phosphorus, and potassium • Annual monitoring of arsenic, cadmium, copper, lead, mercury, nickel, selenium, and zinc	• Alternate power source required	• Minimum of 90 days effective storage capacity required	• Maximum hydraulic loading rate of 2 in/week		• 200 feet to potable water supply wells or drinking water springs • 300 feet to any waters of the state • 300 feet to any residence	• Pertains to land with a high potential for public exposure
Kansas	• Secondary treatment with filtration and disinfection for irrigation of areas with a high probability of body contact			• Storage provided to retain a minimum of 90 days average dry weather flow when no discharge to surface water is available	• Maximum daily application rate of 3 in/ac/day • Maximum annual application rate of 40 in/acre • Based on soil and crop moisture	• Site specific • May be required	• None required	• Projected uses include irrigation of golf courses or public parks with a low probability of body contact • Public access prohibited

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					and/or nutrient requirements of selected crop			during and 8 hours after irrigation
Massachusetts	*Toilet flushing:* • Secondary treatment with filtration (possibly) and disinfection • pH 6 - 9 • 30 mg/l BOD_5 • Turbidity - 5 NTU (not to exceed at any time) • Fecal coliform - 100/100 ml (single sample) • 10 mg/l TSS • 10 mg/l total nitrogen • Class I groundwater permit standards (SDWA Drinking Water Standards)	*Toilet flushing:* • pH - weekly or daily • BOD - weekly • Turbidity - continuous monitoring prior to disinfection • Fecal coliform -once per week • Disinfection UV intensity - daily or chlorine residual - daily • TSS - weekly • Nitrogen - twice per month • Permit standards - variable testing requirements	• EPA Class I Reliability standards may be required • Two independent and separate sources of power • Unit redundancy • Additional storage	• Immediate, permitted discharge alternatives are required for emergency situations and for non-growing season disposal				• The use of reclaimed water for toilet flushing is allowed at commercial facilities where public access to the plumbing is not allowed
Montana	• Oxidized, clarified, coagulated, filtered, and disinfected • Fecal coliform - 2.2/100 ml (7-day median) - 23/100 ml (single sample) • Turbidity	• Effluent to be monitored on a regular basis to show the biochemical and bacteriological quality of the applied wastewater • Monitoring			• Nitrogen and hydraulic loadings determined based on methods in EPA Manual 625/1-81-013 • Hydraulic loading must be based on	• Determined on a case-by-case basis • Consideration is given to groundwater characteristics, past practices, depth to groundwater, cropping	• 100 feet to any water supply well • Distance to surface water determined on a case-by-case basis based on quality of effluent and the level of	• Includes landscape irrigation of parks, playgrounds, schoolyards, unrestricted golf courses, and other areas where the public has

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	- 2 NTU (average) - 5 NTU (not to exceed more than 5 percent of the time during any 24-hour period)	frequency to be determined on a case-by-case basis			the wettest year in ten years	practices, etc.	disinfection	similar access or exposure
Nevada	• At a minimum, secondary treatment with disinfection • 30 mg/l BOD_5 • Fecal coliform - 2.2/100 ml (30-day geometric mean) - 23/100 ml (maximum daily number)						• None required	• Uses include irrigation of cemeteries, golf courses, greenbelts, parks, playgrounds, or commercial or residential lawns
New Jersey	• Fecal Coliform - 2.2/100 ml (7-day median) - 14/100 ml (maximum any one sample) • Minimum chlorine residual - 1.0 mg/l after 15-minute contact at peak hourly flow • Alternative methods of disinfection, such as UV and ozone, may be	• Continuous on-line monitoring of chlorine residual produced oxidant at the compliance monitoring point • For spray irrigation, chlorination levels for disinfection should be continually evaluated to ensure		• Not required when another permitted reuse system or effluent disposal system is incorporated into the system design • If system storage ponds are used, they do not have to be lined • Reject storage ponds shall be lined or sealed to prevent	• Hydraulic loading rate - maximum annual average of 2 in/wk but may be increased based on a site-specific evaluation • The spray irrigation of reclaimed water shall not produce surface runoff or ponding		• 75 feet to potable water supply wells that are existing or have been approved for construction • 75 feet provided from a reclaimed water transmission facility to all potable water supply wells • 100 feet from outdoor public eating,	• Secondary treatment, for the purpose of the manual, refers to the existing treatment requirements in the NJPDES permit, not including the additional reclaimed water for beneficial reuse treatment requirements • A chlorine

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	approved • TSS not to exceed 5 mg/l before disinfection • Total nitrogen - 10 mg/l but may be less stringent if higher limit is still protective of environment • Secondary • Filtration • Chemical addition prior to filtration may be necessary	chlorine residual levels do not adversely impact vegetation • Continuous monitoring for turbidity before disinfection is required • Operating protocol required • User/Supplier Agreement • Annual usage report		measurable seepage • Existing or proposed ponds (such as golf course ponds) are appropriate for storage of reuse water if the ability of the ponds to function as stormwater management systems is not impaired			drinking, and bathing facilities • 100 feet between indoor aesthetic features and adjacent indoor public eating and drinking facilities when in the same room or building	residual of 0.5 mg/l or greater is recommended to reduce odors, slime, and bacterial re-growth
New Mexico	• Adequately treated and disinfected • Fecal coliform - 100/100 ml	• Fecal coliform sample taken at point of diversion to irrigation						• Includes irrigation of parks, playgrounds, schoolyards, golf courses, cemeteries, and other areas where the public has similar access or exposure
North Carolina	• Tertiary quality effluent (filtered or equivalent) • TSS - 5 mg/l (monthly average) - 10 mg/l (daily maximum)	• Continuous on-line monitoring and recording for turbidity or particle count and flow prior to discharge	• All essential treatment units to be provided in duplicate • Five-day side-stream detention pond required for effluent exceeding	• Determined using a mass water balance based upon a recent 25-year period using monthly average precipitation data, potential	• Site specific • Application rate may take both the maximum soil absorption and water needs of the receiving crop into consideration		• 100 feet to any surface waters classified SA, including wetlands • 25 feet to any surface water not classified SA, including wetlands and	• Uses include irrigation of residential lawns, golf courses, parks, school grounds, industrial or commercial site grounds,

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	• Fecal coliform - 14/100 ml (monthly geometric mean) - 25/100 ml (daily maximum) • BOD_5 - 10 mg/l (monthly average) - 15 mg/l (daily maximum) • NH_3 - 4 mg/l (monthly average) - 6 mg/l (daily maximum) • Turbidity not to exceed 10 NTU at any time		turbidity or fecal coliform limits • Automatically activated standby power source to be provided • Certified 24 hours/day operator with a grade level equivalent to or greater than the facility classification	evapotrans-piration data, and soil drainage data • No storage facilities required if it can be demonstrated that other permitted disposal options are available			any swimming pool • 100 feet to any water supply well • 10 feet to any nonpotable well	landscape areas, highway medians, and roadways • Can also be used for aesthetic purposes such as decorative ponds or fountains, dust control, soil compaction, street cleaning, vehicle washing, urinal and toilet flushing, or fire protection in sprinkler systems located in commercial or industrial facilities
North Dakota	• At a minimum, secondary treatment with chlorination • 25 mg/l BOD_5 • 30 mg/l TSS • Fecal coliform - 200/100 ml • Chlorine residual of at least 0.1 mg/l	• BOD_5, TSS, and fecal coliform monitoring once every 2 weeks • Daily monitoring of chlorine residual at the point of use farthest from the treatment plant						• Use applies to irrigation of public property such as parks and golf courses • Signs must be posted in visible areas during irrigation and for 2 hours after irrigation is completed
Ohio	• Biological	*Large system*		• Operational	• Determined by	• Monitoring	• 100 feet to	• Includes parks,

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	treatment and disinfection • 25 mg/l $CBOD_5$ • Fecal coliform (30-day average) - 23/100 ml with no public access buffer area or night application • Limits for metals	*monitoring (150,000 to 500,000 gpd):* • Twice weekly for $CBOD_5$, total coliform (when irrigating) and storage volume • Monthly monitoring for total inorganic nitrogen • Daily monitoring for flow *Small system monitoring (<150,000 gpd):* • Weekly monitoring of $CBOD_5$, total coliform (when irrigating) and storage volume • Daily monitoring of flow		storage of 4 times the daily design flow needed • Storage provisions for at least 130 days of design average flow needed for periods when irrigation is not recommended • Actual storage requirements determined by performing water balance • Permits can be obtained for stream discharge during winter and times of high stream flow to reduce storage needs	calculating a water and nutrient balance	wells upgradient and downgradient of large irrigation systems • Monitoring wells should be sampled at the beginning and the end of the irrigation season	private water well • 300 feet to community water well • 100 feet to sink hole • 50 feet to drainage way • 50 feet to surface water • 100 feet to road right-of-way without windbreak using spray irrigation • 10 feet to road right-of-way with windbreak or with flood irrigation • 50 feet to property line	golf courses, lawns, highway medians, and playing fields
Oregon	*Parks, playgrounds, schoolyards, and golf courses with contiguous residences:* • Level IV - biological treatment, clarification,	*Parks, playgrounds, schoolyards, and golf courses with contiguous residences:* • Total coliform sampling - one time a day	• Standby power with capacity to fully operate all essential treatment processes • Redundant treatment facilities and monitoring				*Parks, playgrounds, schoolyards, and golf courses with contiguous residences:* • None required *Landscape impoundments and construction*	• No direct public contact is allowed during the irrigation cycle

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Table A-1. Unrestricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates [1]	Groundwater Monitoring [1]	Setback Distances [1] [2]	Other
	coagulation, filtration, and disinfection • Total coliform - 2.2/100 ml (7-day median) - 23/100 ml (maximum any sample) • Turbidity - 2 NTU (24-hour mean) - 5 NTU (5 percent of time during a 24-hour period) *Landscape impoundments and construction use:* • Level II - biological treatment and disinfection • Total coliform - 240/100 ml (2 consecutive samples) - 23/100 ml (7-day median)	• Turbidity - hourly *Landscape impoundments and construction use:* • Total coliform sampling - once a week	equipment to meet required levels of treatment • Alarm devices to provide warning of loss of power and/or failure of process equipment				*use:* • 10-foot buffer with surface irrigation • 70-foot buffer with spray irrigation • No spray irrigation within 100 feet of drinking fountains or food preparation areas	
South Carolina	• Advanced wastewater treatment • BOD_5 and TSS - 5 mg/l (monthly average) - 7.5 mg/l	• Minimum of one fecal or total coliform presence/ absence measurement daily • Nitrate		• Storage facilities are not required to be lined • Covered storage systems or other	• Hydraulic - maximum of 0.5 - 2 in/wk depending on depth to groundwater • A nitrate to nitrogen	• May be required	• None required	• Applies to application of reclaimed water in areas with a high potential for contact • Includes

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State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates [1]	Groundwater Monitoring [1]	Setback Distances [1] [2]	Other
	(weekly average) • Turbidity - 1 NTU (monthly average) - 5 NTU (not to exceed based on an average for 2 consecutive days) • Total coliform - similar to standards in State Primary Regulations - for a system that collects at least 40 samples per month, if no more than 5 percent are total coliform-positive, the system will be in compliance with the MCL for total coliform • Total chlorine residual limits based on site conditions and distribution system design	monitoring required		alternative methods may be required to maintain effluent quality prior to distribution	loading balance may be required • Application rates in excess of 2 in/wk may be approved			residential irrigation systems, multifamily irrigation systems, commercial irrigation systems in common residential areas, public parks, and open spaces
South Dakota	• Secondary treatment and disinfection			• Minimum of 210 days capacity	• Maximum application rate limited to	• Shallow wells in all directions of major		

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State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates [1]	Groundwater Monitoring [1]	Setback Distances [1] [2]	Other
	• Total coliform - 200/100 ml (geometric mean)			without consideration for evaporation	2 in/acre/wk or a total of 24 in/acre/yr	groundwater flow from site and no more than 200 feet outside of the site perimeter, spaced no more than 500 feet apart, and extending into the groundwater table • Shallow wells within the site are also recommended		
Tennessee	• Biological treatment • Additional treatment requirements are determined on a case-by-case basis • Disinfection required • 30 mg/l BOD_5 and TSS (monthly average) • Fecal coliform - 200/100 ml	• Site specific		• Storage requirements determined by either of two methods 1) use of water balance calculations or, 2) use of a computer program that was developed based upon an extensive NOAA study of climatic variations throughout the United States	• Nitrogen - percolate nitrate-nitrogen not to exceed 10 mg/l • Hydraulic - based on water balance using 5-year return monthly precipitation	• Required	*Surface Irrigation:* • 100 feet to site boundary • 50 feet to on site streams, ponds, and roads *Spray Irrigation:* [1] Open Fields • 300 feet to site boundary • 150 feet to on site streams, ponds, and roads [2] Forested • 150 feet to site boundary • 75 feet to on site streams, ponds, and roads	• Pertains to irrigation of parks, green areas, and other public or private land where public use occurs or is expected to occur
Texas	• Type I	• Sampling and			• Based on			• Type I

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Table A-1. Unrestricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates [1]	Groundwater Monitoring [1]	Setback Distances [1] [2]	Other
	reclaimed water *Reclaimed water on a 30-day average to have a quality of:* • 5 mg/l BOD_5 or $CBOD_5$ • 10 mg/l for landscape impoundment) • Turbidity - 3 NTU • Fecal coliform - 20/100 ml (geometric mean) - 75/100 ml (not to exceed in any sample)	analysis twice per week for BOD_5 or $CBOD_5$, turbidity, and fecal coliform • Periodic fecal coliform sampling in the reclaimed water distribution system may be necessary			water balance			reclaimed water use defined as use of reclaimed water where contact between humans and the reclaimed water is likely • Uses include residential irrigation, irrigation of public parks, golf courses with unrestricted public access, schoolyards or athletic fields, fire protection, toilet flushing, and other uses
Utah	• Type I treated wastewater - secondary treatment with filtration and disinfection • 10 mg/l BOD (monthly average) • Turbidity prior to disinfection - not to exceed 2 NTU (daily average) - not to exceed 5 NTU at any	• Daily composite sampling required for BOD • Continuous turbidity monitoring prior to disinfection • Daily monitoring of fecal coliform • Continuous total residual chlorine	• Alternative disposal option or diversion to storage required if turbidity or chlorine residual requirements not met				• 50 feet to any potable water well • Impoundments at least 500 feet from any potable water well	• Uses allowed where human exposure is likely include residential irrigation, non-residential landscape irrigation, golf course irrigation, toilet flushing, fire protection, and other uses • For residential landscape

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Table A-1. Unrestricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates [1]	Groundwater Monitoring [1]	Setback Distances [1] [2]	Other
	time • Fecal coliform - none detected (weekly median as determined from daily grab samples) - 14/100 ml (not to exceed in any sample) • 1.0 mg/l total residual chlorine after 30 minutes contact time at peak flow • pH 6 - 9	monitoring • pH monitored continuously or by daily grab samples						irrigation at individual homes, additional quality control restrictions may be required
Washington	*Landscape irrigation, decorative fountains, street cleaning, fire protection, and toilet flushing:* • Class A - oxidized, coagulated, filtered, and disinfected • Total coliform - 2.2/100 ml (7-day mean) - 23/100 ml (single sample) *Landscape impoundment and construction uses:*	• BOD – 24-hour composite samples collected at least weekly • TSS – 24-hour composite samples collected at least daily • Total coliform and dissolved oxygen - grab samples collected at least daily • Continuous on-line monitoring of turbidity	• Warning alarms independent of normal power supply • Back-up power source • Emergency storage: short-term, 1 day; long-term, 20 days • Multiple treatment units or storage or disposal options • Qualified personnel available or on	• Storage required when no approved alternative disposal system exists • Storage volume established by determining storage period required for duration of a 10-year storm, using a minimum of 20 years of climatic data • At a minimum, system storage capacity	• Hydraulic loading rate to be determined based on a detailed water balance analysis	• May be required • Monitoring program will be based on reclaimed water quality and quantity, site specific soil and hydrogeologic characteristics, and other considerations	• 50 feet to any potable water supply well • Unlined impoundments - 500 feet between perimeter and any potable water supply well • Lined impoundments - 100 feet between perimeter and any potable water supply well	• Uses include irrigation of open access areas (such as golf courses, parks, playgrounds, schoolyards, residential landscapes, or other areas where the public has similar access or exposure to the reclaimed water) and use in decorative fountains and landscape impoundments

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Table A-1. Unrestricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates [1]	Groundwater Monitoring [1]	Setback Distances [1] [2]	Other
	• Class C - oxidized and disinfected • Total coliform - 23/100 ml (7-day mean) - 240/100 ml (single sample) *General compliance requirements:* • 30 mg/l BOD and TSS (monthly mean) • Turbidity - 2 NTU (monthly) - 5 NTU (not to exceed at any time) • Minimum chlorine residual of 1 mg/l after a contact time of 30 minutes		call at all times the irrigation system is operating	should be the volume equal to 3 times that portion of the average daily flow for which no alternative reuse or disposal system is permitted				• Also includes use for street cleaning, construction, fire protection in hydrants or sprinkler systems, toilet flushing in commercial or industrial facilities and in apartments and condos where the residents do not have access to the plumbing system
Wyoming	• Minimum of Class A wastewater - advanced treatment and/or secondary treatment and disinfection • Fecal coliform - 2.2/100 ml or less	• Treated wastewater to be analyzed for fecal coliform, nitrate as N, ammonia as N, and pH at a minimum • Monitoring frequency - once per month for	• Multiple units and equipment • Alternative power sources • Alarm systems and instrumenta-tion • Operator certification and standby capability • Bypass and	• Emergency storage	• Will be applied for the purpose of beneficial reuse and will not exceed the irrigation demand of the vegetation at the site • Not to be applied at a rate greater than the		• 30 feet to adjacent property lines • 30 feet to all surface waters • 100-feet to all potable water supply wells • 100-foot buffer zone around spray site	• Pertains to land with a high potential for public exposure

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Table A-1. Unrestricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates [1]	Groundwater Monitoring [1]	Setback Distances [1] [2]	Other
		lagoon systems - once per week for mechanical systems • Frequency specified in NPDES permit required if more frequent	dewatering capability • Emergency storage		agronomic rate for the vegetation at the site • Will be applied in a manner and time that will not cause any surface runoff or contamination of a groundwater aquifer			

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
Alabama	• Minimum EPA secondary, or equivalent to secondary, limits and appropriate disinfection • If wastewater stabilization pond is used, pond must meet ADEM requirements with second cell being used as a holding pond • Mechanical systems, if used, should allow as little nitrification as possible • Disinfection must be performed through one of the following processes - breakpoint chlorination, ozonation, or ultraviolet disinfection - storage of the treated wastewater for a period of 20 days in a holding pond prior to		• Controls required to indicate any system malfunction or permit varied field operations	• Based on water balance performed on a monthly basis with a precipitation input using a 5-year, 24-hour rainfall event, 30-year minimum base period • In addition to storage dictated by water balance, a minimum of 15 days storage should be provided for contingencies	• Based on soil permeability and nitrogen limits (10 mg/l nitrate) • Excessive rainwater run-off should be diverted • Excessive ponding should be avoided	• At least three downgradient monitoring wells • At least one upgradient monitoring well • Contaminants in groundwater not to exceed primary and secondary maximum contaminant levels • Minimum depth to groundwater, without use of an underdrain collection system, shall be 4 feet	• 100 feet to property lines • 300 feet to existing habitable residences • Spray irrigation not allowed within 100 feet of any perennial lake or stream • If irrigation causes an intermittent stream to become perennial, the irrigation must cease within 100 feet of the stream • Spray irrigation not allowed in wellhead protection area (WHPA 1) – if no wellhead delineation exists, minimum distance for application shall be 1,000 feet or as required • No sites within 100-year floodplain	• Disinfection required for public access areas such as golf courses • May use breakpoint chlorination with rapid, uniform mixing to a free chlorine residual of 2 mg/l at a contact period of 30 minutes at average daily flow rate • May use ozonation or ultraviolet disinfection systems; a geometric mean limit of 126/100 ml for E. Coli, or 33/ 100 ml for enterococci bacteria will be required; the total suspended solids concentration of the effluent, prior to disinfection, must be no more than 5 mg/l which

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	discharge to the application site							may require installation of a filtration process
Arizona	• Class B reclaimed water - secondary treatment and disinfection • Fecal coliform - 200/100 ml (not to exceed in 4 of the last 7 daily samples) - 800/100 ml (single sample maximum)	• Case-by-case basis			• Application rates based on either the water allotment assigned by the Arizona Department of Water Resources (a water balance that considers consumptive use of water by the crop, turf, or landscape vegetation) or an alternative approved method			• Includes irrigation of golf courses and other restricted access landscapes • Application methods that reasonably preclude human contact with reclaimed water will be used when irrigating
Arkansas	• Secondary treatment and disinfection	• As required by regulatory agency		• Based on water balance using divisional average annual 90 percentile rainfall	• Hydraulic - 0.5 to 4.0 in/wk • Nitrogen - percolate nitrate-nitrogen not to exceed 10 mg/l	• Required • One well upgradient • One well within site • One well downgradient • More wells may be required on a case-by-case basis	• Determined on case-by-case basis	
California	• Disinfected secondary-23 recycled water - oxidized and disinfected • Total coliform	• Total coliform - sampled at least once daily from the disinfected effluent	• Warning alarms • Back-up power source • Multiple treatment units				• No irrigation with, or impoundment of, disinfected secondary-23 recycled water	• Includes landscape irrigation of cemeteries, freeway landscapes,

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	- 23/100 ml (7-day median) - 240/100 ml (not to exceed in more than one sample in any 30-day period)		capable of treating entire flow with one unit not in operation or storage or disposal provisions • Emergency storage or disposal: short-term, 1 day; long-term, 20 days • Sufficient number of qualified personnel				within 100 feet of any domestic water supply well • No spray irrigation within 100 feet of a residence or a place where public exposure could be similar to that of a park, playground, or schoolyard	and restricted access golf courses
Colorado	• Secondary treatment with disinfection • E. coli - 126/100 ml (monthly average) - 235/100 ml (single sample maximum in any calendar month) • 30 mg/l TSS as a daily maximum	*Treaters:* • Quality of reclaimed domestic wastewater produced and delivered at the point of compliance *Applicators:* • Total volume of reclaimed domestic wastewater applied per year or season • The maximum monthly volume applied • Each location with the associated acreage where			• Application rates shall protect surface and groundwater quality and irrigation shall be controlled to minimize ponding		• No impoundment or irrigation of reclaimed water within 100 feet of any well used for domestic supply unless, in the case of an impoundment, it is lined with a synthetic material with a permeability of 10^{-6} cm/sec or less	

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
		reclaimed domestic wastewater was applied • The beginning and end time for each date that reclaimed domestic wastewater is applied						
Delaware	• Biological treatment and disinfection • 30 mg/l BOD_5 • 30 mg/l TSS • Fecal coliform - 200/100 ml	• Continuous on-line monitoring of residual disinfection concentrations • Parameters which may require monitoring include volume of water applied to spray fields, BOD, suspended solids, fecal coliform bacteria, pH, COD, TOC, ammonia nitrogen, nitrate nitrogen, total Kjeldahl nitrogen, total phosphorus, chloride, Na, K, Ca, Mg, metals, and priority		• Storage provisions required either as a separate facility or incorporated into the pretreatment system • Minimum 15 days storage required unless other measures for controlling flow are demonstrated • Must determine operational, wet weather, and water balance storage requirements • Separate off-line system for storage of reject wastewater with a	• Maximum design wastewater loadings limited to 2.5 in/wk • Maximum instantaneous wastewater application rates limited to 0.25 in/hour • Design wastewater loading must be determined as a function of precipitation, evapotrans-piration, design percolation rate, nitrogen loading and other constituent loading limitations, groundwater and drainage conditions, and	• Required • One well upgradient of site or otherwise outside the influence of the site for background monitoring • One well within wetted field area of each drainage basin intersected by site • Two wells down-gradient in each drainage basin intersected by site • One well upgradient and One well downgradient of the pond treatment and storage facilities in	• Determined on a case-by-case basis	• Regulations pertain to sites limited to public access at specific periods of time

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
		pollutants • Parameters and sampling frequency determined on a case-by-case basis		minimum capacity equal to 2-day average daily design flow required	average and peak design wastewater flows and seasonal fluctuations	each drainage basin intersected by site • May require measurement of depth to groundwater, pH, COD, TOC, nitrate nitrogen, total phosphorus, electrical conductivity, chloride, fecal coliform bacteria, metals, and priority pollutants • Parameters and sampling frequency determined on a case-by-case basis		
Florida	• Secondary treatment with filtration and high-level disinfection • Chemical feed facilities to be provided • 20 mg/l $CBOD_5$ (annual average) • 5 mg/l TSS (single sample) • Total chlorine	• Parameters to be monitored and sampling frequency to be identified in wastewater facility permit • Minimum schedule for sampling and testing based on system capacity established for flow, pH,	• Class I reliability - requires multiple or back-up treatment units and a secondary power source • Minimum reject storage capacity equal to 1 day flow at the average daily design	• At a minimum, system storage capacity shall be the volume equal to 3 times the portion of the average daily flow for which no alternative reuse or disposal system is permitted • Water balance	• Site specific • Design hydraulic loading rate - maximum annual average of 2 in/wk is recommended • Based on nutrient and water balance assessments	• Required • One upgradient well located as close as possible to the site without being affected by the site's discharge (background well) • One well at the edge of the zone of	• 75 feet to potable water supply wells • 75 feet from reclaimed water transmission facility to public water supply well • Low trajectory nozzles required within 100 feet of outdoor public	• Rules do not differentiate between unrestricted and restricted urban reuse • Tank trucks can be used to apply reclaimed water if requirements are met • Cross-connection

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	residual of at least 1 mg/l after a minimum acceptable contact time of 15 minutes at peak hourly flow • Fecal coliform - over 30-day period, 75 percent of samples below detection limits - 25/100 ml (single sample) • pH 6 - 8.5 • Limitations to be met after disinfection	chlorine residual, dissolved oxygen, suspended solids, $CBOD_5$, nutrients, and fecal coliform • Continuous on-line monitoring of turbidity prior to disinfection • Continuous on-line monitoring of total chlorine residual or residual concentrations of other disinfectants • Monitoring for *Giardia* and *Cryptosporidium* based on treatment plant capacity - $\geq$ 1 mgd, sampling one time during each two-year period - < 1 mgd , sampling one time during each 5-year period - samples to be taken immediately	flow of the treatment plant or the average daily permitted flow of the reuse system, whichever is less • Minimum system size of 0.1 mgd (not required for toilet flushing and fire protection uses) • Staffing - 24 hrs/day, 7 days/wk or 6 hrs/day, 7 days/wk with diversion of reclaimed water to reuse system only during periods of operator presence	required with volume of storage based on a 10-year recurrence interval and a minimum of 20 years of climatic data • Not required if alternative system is incorporated into the system design to ensure continuous facility operation • Existing or proposed lakes or ponds (such as golf course ponds) are appropriate for storage if it will not impair the ability of the lakes or ponds to function as a stormwater management system • Aquifer storage and recovery allowed as provision of storage		discharge downgradient of the site (compliance well) • One well downgradient from the site and within the zone of discharge (intermediate well) • One well located adjacent to unlined storage ponds or lakes • Other wells may be required depending on site-specific criteria • Quarterly monitoring required for water level, nitrate, total dissolved solids, arsenic, cadmium, chloride, chromium, lead, fecal coliform, pH, and sulfate • Monitoring may be required for	eating, drinking, and bathing facilities • 100 feet from indoor aesthetic features using reclaimed water to adjacent indoor public eating and drinking facilities • 200 feet from unlined storage ponds to potable water supply wells	control and inspection program required

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State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
		following disinfection process • Primary and secondary drinking water standards to be monitored by facilities ≥ 100,000 gpd				additional parameters based on site-specific conditions and groundwater quality		
Georgia	• Secondary treatment followed by coagulation, filtration, and disinfection • 5 mg/l BOD • 5 mg/l TSS • Fecal coliform - 23/100 ml (monthly average) - 100/100 ml (maximum any sample) • pH 6 - 9 • Turbidity not to exceed 3 NTU prior to disinfection • Detectable disinfectant residual at the delivery point	• Continuous turbidity monitoring prior to disinfection • Weekly sampling for TSS and BOD • Daily monitoring for fecal coliform • Daily monitoring for pH • Detectable disinfection residual monitoring	• Multiple process units • Ability to isolate and bypass all process units • System must be capable of treating peak flows with the largest unit out of service • Equalization may be required • Back-up power supply • Alarms to warn of loss of power supply, failure of pumping systems, failure of disinfection systems, or turbidity greater than 3 NTU	• Reject water storage equal to at least 3 days of flow at the average daily design flow • One of the following options must be in place to account for wet weather periods - sufficient storage onsite or at the customer's location to handle the flows until irrigation can be resumed - additional land set aside that can be irrigated without causing harm to the cover crop			• Determined on a case-by-case basis	

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
				- An NPDES permit for all or part of the flow				
Hawaii	• R-2 water - oxidized and disinfected • Fecal coliform - 23/100 ml (7-day median) - 200/100 ml (not to exceed in more than one sample in any 30-day period) • Theoretical chlorine contact time of 15 minutes and actual modal contact time of 10 minutes throughout which the chlorine residual is 0.5 mg/l	• Daily flow monitoring • Continuous turbidity monitoring prior to and after filtration process • Continuous measuring and recording of chlorine residual • Daily monitoring of fecal coliform • Weekly monitoring of BOD_5 and suspended solids	• Multiple or standby units required with sufficient capacity to enable effective operation with any one unit out of service • Alarm devices required for loss of power, high water levels, failure of pumps or blowers, high head loss on filters, high effluent turbidity, loss of coagulant or polymer feed, and loss of chlorine residual • Standby power source required for treatment plant and distribution pump stations	• 20 days storage required unless it can be demonstrated that another time period is adequate or that no storage is necessary • Storage requirements based on water balance using at least a 30-year record • Reject storage required with a volume equal to 1 day of flow at the average daily design flow • Emergency system storage not required where an alternate effluent disposal system has been approved	• Design application rate determined by water balance	• Required • Groundwater monitoring system may consist of a number of lysimeters and/or monitoring wells depending on site size, site characteristics, location, method of discharge. and other appropriate considerations • One well upgradient and two wells downgradient for project sites 500 acres or more • One well within the wetted field area for each project whose surface area is greater than or equal to 1,500 acres • One lysimeter per 200 acres • One lysimeter for project sites	*R-2 water:* • For spray irrigation applications, 500 feet to residence property or a place where public exposure could be similar to that at a park, elementary schoolyard, or athletic field • Minimum of 100 feet to any drinking water supply well • Outer edge of impoundment at least 300 feet from any drinking water supply well	• R-2 water can be used for spray irrigation of freeway and cemetery landscapes and other areas where access is controlled • If alternative application methods are used, such as subsurface, drip or surface irrigation, a lesser quality reclaimed water may be suitable • R-2 water used in spray irrigation will be performed when the area is closed to the public and the public is absent from the area, and will end at least 1 hour before the area is open to the public • Subsurface irrigation may

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State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
						that have greater than 40 but less than 200 acres • Additional lysimeters may be necessary to address public health or environmental protection concerns related to variable characteristics of the subsurface or of the operations of the project		be performed at any time
Idaho	• Oxidized and disinfected • Total coliform - 23/100 ml (7 day median)							• Includes irrigation of golf courses, cemeteries, roadside vegetation, and other areas where individuals have access or exposure • Irrigation to be accomplished during periods of non-use
Illinois	• Two-cell lagoon system with tertiary sand filtration and disinfection or			• Minimum storage capacity equal to at least 150 days of wastewater at	• Based on the limiting characteristic of the treated wastewater and the site	• Required • One well upgradient for determining background concentrations	• 25 feet to any residential lot line if surrounded by a fence with a minimum	

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	mechanical secondary treatment with disinfection			design average flow except in southern Illinois areas where a minimum of 120 days of storage capacity to be provided • Storage can be determined based on a rational design that must include capacity for the wettest year with a 20-year return frequency	• Balances must be calculated and submitted for water, nitrogen, phosphorus, and BOD	• Two wells downgradient in the dominant direction of groundwater movement • Wells between each potable water well and the application area if within 1,000 feet • Monitoring of nitrates, ammonia nitrogen, chlorides, sulfates, pH, total dissolved solids, phosphate, and coliform bacteria	height of 40 inches • No buffer required if irrigation of golf course occurs only during the hours between dusk and dawn • No buffer required if the application and its associated drying time occur during a period when the area is closed to the public	
Indiana	• Secondary treatment and disinfection • 30 mg/l BOD_5 • 30 mg/l TSS • Fecal coliform - 200/100 ml (7-day median) - 800/100 ml (single sample) • pH 6 - 9 • Total chlorine residual after a minimum contact time of 30 minutes at least 1 mg/l (if	• Daily monitoring of TSS, coliform, and chlorine residual • Weekly monitoring of BOD and pH • Monthly monitoring of total nitrogen, ammonium nitrogen, nitrate nitrogen, phosphorus, and potassium	• Alternate power source required	• Minimum of 9 days effective storage capacity required	• Maximum hydraulic loading rate of 2 in/week		• 200 feet to potable water supply wells or drinking water springs • 300 feet to any waters of the state • 300 feet to any residence	• Public access to be restricted for 30 days after land application of wastewater

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	chlorination is used for disinfection)	• Annual monitoring of arsenic, cadmium, copper, lead, mercury, nickel, selenium, and zinc						
Iowa	• At a minimum, treatment equivalent to that obtained from a primary lagoon cell • Disinfection - required for all land application systems with spray irrigation application technique - must precede actual spraying of the wastewater on to a field area and must not precede storage - minimum contact time of 15 minutes with equipment necessary to maintain a residual chlorine level of 0.5 mg/l	• Monitoring of the following parameters required unless it has been demonstrated that they are present in insignificant amounts in the influent wastewater: total organic carbon, total dissolved solids, sodium absorption ratio, electrical conductivity, total nitrogen, ammonia nitrogen, organic nitrogen, nitrate nitrogen, total phosphorus, chloride, pH, alkalinity, hardness, trace	• Minimum of two storage cells required capable of series and parallel operation	• Minimum days of storage based on climatic restraints • When flows are generated only during the application period, a storage capacity of 45 days or the flow generated during the period of operation (whichever is less) must be provided • When discharging to a receiving waterway on a periodic basis, storage for 180 days of average wet weather flow is required	• Determined by using a water balance per month of operation	• Monitoring required adjacent to the site both upstream and downstream of the site in reference to the general groundwater flow direction	• 300 feet to existing dwellings or public use areas (not including roads and highways) • 400 feet to any existing potable water supply well not located on property • 300 feet to any structure, continuous flowing stream, or other physiographic feature that may provide direct connection between the groundwater table and the surface • Wetted disposal area to be at least 50 feet inside the property	• Categorized as land application using slow rate system (irrigation) • Application to public use areas given as example of permissible application with requirements - public not allowed into an area when spraying is being conducted - any drinking water fountains located on or near the application area must be protected - for golf courses using “wastewater”, notice of its use must be

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
		elements, and coliform bacteria • Location of monitoring in effluent prior to site application • Reporting frequency depends on size of system					line of the land application site • 1,000 feet to any shallow public water supply well • 500 feet to any public lake or impoundment • _ mile to any public lake or impoundment used as a source of raw water by a potable water supply	given and warning signs posted
Kansas	• Secondary treatment and disinfection for irrigation of areas with a low probability of body contact			• Storage provided to retain a minimum of 90-days average dry weather flow when no discharge to surface water is available	• Maximum daily application rate of 3 in/ac/day • Maximum annual application rate of 40 in/acre • Based on soil and crop moisture and/or nutrient requirements of selected crop	• Site specific • May be required	• None required	• Projected uses include irrigation of golf courses or public parks with a low probability of body contact
Maryland	• 70 mg/l BOD • 90 mg/l TSS • Fecal coliform - 3/100 ml • pH 6.5 - 8.5			• Minimum of 60-days storage to be provided for all systems receiving wastewater flows throughout the	• Maximum application rate of 2 in/wk on annual average basis • Water balance required based on wettest year in the last 10	• May be required • One well upgradient of site • Two wells adjacent to the property line and	• 200 feet to property lines, waterways, and roads for spray irrigation • 500 feet to housing developments and parks for	• Pertains to golf course irrigation

(1) Distances are from edge of wetted perimeter unless otherwise noted.

Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
				year	years of record • Actual application rate accepted must consider permeability of the soils, depth to groundwater, and the nutrient balance of the site	downgradient of site • Monitoring frequency determined on a case-by-case basis	spray irrigation • Reduction of the buffer zone up to 50 percent will be considered with adequate windbreak • Minimum buffer zone of 50 feet for all other types of slow rate systems	
Massachusetts	• Secondary treatment with filtration and disinfection • pH 6 - 9 • 10 mg/l BOD_5 • Turbidity - 2 NTU (average over 24-hour period) - 5 NTU (not to exceed at any time) • Fecal coliform - no detectable colonies (7-day median) - 14/100 ml (single sample) • 5 mg/l TSS • 10 mg/l total nitrogen • Class I groundwater permit standards	• pH - daily • BOD - weekly • Turbidity - continuous monitoring prior to disinfection • Fecal coliform - daily • Disinfection UV intensity - daily or chlorine residual - daily • TSS - twice per week • Nitrogen - twice per month • Phosphorus - twice per month • Heterotrophic plate count - quarterly • MS-2 phage - quarterly	• EPA Class I Reliability standards may be required • Two independent and separate sources of power • Unit redundancy • Additional storage	• Immediate, permitted discharge alternatives are required for emergency situations and for non-growing season disposal		• Required • Monitoring wells to be located and constructed to strategically sample the geologic units of interest between the discharges and sensitive receptors and withdrawal points • Sensitive receptors include, but are not limited to public and private wells, surface waters, embayments, and ACECs • Monitoring and testing frequency and	• 100 feet to buildings, residential property, private wells, Class A surface water bodies, and surface water intakes • Other than for private wells, using a green barrier in the form of hedges or trees placed at the dwelling side of the buffer may reduce the setback distance to 50 feet • No spray irrigation directed into Zone I of	• Includes the irrigation of golf courses • Spray irrigation must take place during non-operational hours and cannot result in any ponding

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	(SDWA Drinking Water Standards)	• Permit standards - variable testing requirements				parameters determined based on land use, effluent quality and quantity, and the sensitivity of receptors	public water supply wells	
Missouri	• Secondary treatment equivalent to treatment obtained from primary wastewater pond cell • Disinfected prior to application (not storage) • Total residual chlorine of 0.5 mg/l after 15 minutes of contact time at peak flow • Fecal coliform - 200/100 ml			• Minimum of 45 days in south with no discharge • Minimum of 90 days in north with no discharge • Based on the design wastewater flows and net rainfall minus evaporation expected for a one in 10-year return frequency for the storage period selected	• Application rates shall in no case exceed - 0.5 in/hour - 1.0 in/day - 3.0 in/week • Maximum annual application rate not to exceed a range from 4 to 10 percent of the design sustained permeability rate for the number of days per year when soils are not frozen • Nitrogen loading not to exceed the amount of nitrogen that can be used by the vegetation to be grown	• Minimum of one well between site and public supply well	• 150 feet to existing dwellings or public use areas, excluding roads or highways • 50 feet to property lines • 300 feet to potable water supply wells not on property, sinkholes, and losing streams or other structure or physiographic feature that may provide direct connection between the groundwater table and the surface	• Public restricted from area during application
Montana	• Oxidized and disinfected • Fecal coliform - 200/100 ml	• Effluent to be monitored on a regular basis to show the			• Nitrogen and hydraulic loadings determined	• Determined on a case-by-case basis • Consideration	• Buffer zones determined on a case-by-case basis if less	• Includes landscape irrigation of golf courses,

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	(7-day median) - 400/100 ml (any two consecutive samples)	biochemical and bacteriological quality of the applied wastewater • Monitoring frequency to be determined on a case-by-case basis			based on methods in EPA Manual 625/1-81-013 • Hydraulic loading must be based on the wettest year in ten years	is given to groundwater characteristics, past practices, depth to groundwater, cropping practices, etc.	than 200 feet • If low trajectory nozzles are used, the buffer zone can be reduced to 50 feet • 100 feet to any water supply well • Distance to surface water determined on a case-by-case basis based on quality of effluent and the level of disinfection	cemeteries, freeway landscapes, and landscapes in other areas where the public has similar access or exposure • Public access must be restricted during the period of application
Nebraska	• Biological treatment • Disinfected prior to application • Fecal coliform limit to be established	• Site specific			• Hydraulic loading rate should not exceed 4 in/wk • Nitrogen loading not to exceed crop uptake	• Site specific		• Includes irrigation of golf courses and other public use areas
Nevada	• At a minimum, secondary treatment with disinfection • 30 mg/l BOD_5 *No buffer zone*: • Fecal coliform - 2.2/100 ml (30-day geometric mean) - 23/100 ml (maximum						• None or 100 foot minimum buffer required depending on level of disinfection	• Uses include irrigation of golf courses, cemeteries, or greenbelts where public access to the site being irrigated is controlled and human contact with the treated effluent

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	daily number) *100' buffer zone:* • Fecal coliform - 23/100 ml (30-day geometric mean) - 240/100 ml (maximum daily number)							does not occur or cannot reasonably be expected
New Jersey	• Fecal coliform - 2.2/100 ml (7-day median) - 14/100 ml (maximum any one sample) • Minimum chlorine residual - 1.0 mg/l after 15-minute contact at peak hourly flow • Alternative methods of disinfection, such as UV and ozone, may be approved • TSS not to exceed 5 mg/l before disinfection • Total nitrogen - 10 mg/l but may be less stringent if higher limit is still protective of environment	• Continuous on-line monitoring of chlorine residual produced oxidant at the compliance monitoring point • For spray irrigation, chlorination levels for disinfection should be continually evaluated to ensure chlorine residual levels do not adversely impact vegetation • Continuous monitoring for turbidity before disinfection is required • Operating		• Not required when another permitted reuse system or effluent disposal system is incorporated into the system design • If system storage ponds are used, they do not have to be lined • Reject storage ponds shall be lined or sealed to prevent measurable seepage • Existing or proposed ponds (such as golf course ponds) are appropriate for storage of reuse water if the ability of the ponds to	• Hydraulic loading rate - maximum annual average of 2 in/wk but may be increased based on a site-specific evaluation • The spray irrigation of reclaimed water shall not produce surface runoff or ponding		• 75 feet to potable water supply wells that are existing or have been approved for construction • 75 feet provided from a reclaimed water transmission facility to all potable water supply wells • 100 feet from outdoor public eating, drinking, and bathing facilities	• Secondary treatment, for the purpose of the manual, refers to the existing treatment requirements in the NJPDES permit, not including the additional reclaimed water for beneficial reuse treatment requirements • A chlorine residual of 0.5 mg/l or greater is recommended to reduce odors, slime, and bacterial re-growth

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	• Secondary • Filtration • Chemical addition prior to filtration may be necessary	protocol required • User/Supplier Agreement • Annual usage report		function as stormwater management systems is not impaired				
New Mexico	• Adequately treated and disinfected • Fecal coliform of 1000/100 ml	• Fecal coliform sample taken at point of diversion to irrigation system						• Includes irrigation of freeway landscapes and landscapes in other areas where the public has similar access or exposure
North Carolina	• Tertiary quality effluent (filtered or equivalent) • TSS - 5 mg/l (monthly average) - 10 mg/l (daily maximum) • Fecal coliform - 14/100 ml (monthly geometric mean) - 25/100 ml (daily maximum) • BOD_5 - 10 mg/l (monthly average) - 15 mg/l (daily	• Continuous on-line monitoring and recording for turbidity or particle count and flow prior to discharge	• All essential treatment units to be provided in duplicate • Five-day side-stream detention pond required for effluent exceeding turbidity or fecal coliform limits • Automatically activated standby power source to be provided • Certified operator 24 hours/day with a grade level equivalent to	• Determined using a mass water balance based upon a recent 25-year period using monthly average precipitation data, potential evapotrans-piration data, and soil drainage data • No storage facilities required if it can be demonstrated that other permitted disposal options are	• Site specific • Application rate may take both the maximum soil absorption and water needs of the receiving crop into consideration		• 100 feet to any surface waters classified SA, including wetlands • 25 feet to any surface water not classified SA, including wetlands and any swimming pool • 100 feet to any water supply well • 10 feet to any nonpotable well	• Uses include irrigation of golf courses, cemeteries, industrial or commercial site grounds, landscape areas, highway medians, and roadways

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	maximum) • NH_3 - 4 mg/l (monthly average) - 6 mg/l (daily maximum) • Turbidity not to exceed 10 NTU at any time		or greater than the facility classification on call	available				
North Dakota	• At a minimum, secondary treatment • 25 mg/l BOD_5 • 30 mg/l TSS • Fecal coliform - 200/100 ml	• BOD_5 and TSS monitoring once every 2 weeks • Fecal coliform - twice weekly for mechanical plants - once per week for lagoon systems						• Use applies to irrigation of public property such as parks and golf courses • Irrigation should take place during hours when the public does not have access to the area being irrigated
Ohio	• Biological treatment • Disinfection should be considered • 40 mg/l $CBOD_5$ • Fecal coliform (30-day average) - 23/100 ml with no public access buffer - 200/100 ml with 100-foot	*Large system monitoring (150,000 to 500,000 gpd):* • Twice weekly for $CBOD_5$, total coliform (when irrigating) and storage volume • Monthly monitoring for total inorganic nitrogen		• Operational storage of 4 times the daily design flow needed • Storage provisions for at least 130 days of design average flow needed for periods when irrigation is not recommended • Actual storage	• Determined by calculating a water and nutrient balance	• Monitoring wells upgradient and downgradient of large irrigation systems • Monitoring wells should be sampled at the beginning and the end of the irrigation season	• 100 feet to private water well • 300 feet to community water well • 100 feet to sink hole • 50 feet to drainage way • 50 feet to surface water • 100 feet to road right-of-way without	

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	public access buffer - 1,000/100 ml with 200 foot public access buffer • Limits for metals	• Daily monitoring for flow *Small system monitoring (<150,000 gpd):* • Weekly monitoring of $CBOD_5$, total coliform (when irrigating) and storage volume • Daily monitoring of flow		requirements determined by performing water balance • Permits can be obtained for stream discharge during winter and times of high stream flow to reduce storage needs			windbreak using spray irrigation • 10 feet to road right-of-way with windbreak or with flood irrigation • 50 feet to property line	
Oklahoma	• Secondary treatment and disinfection		• Standby power required for continuity of operation during power failures	• Required for periods when available wastewater exceeds design hydraulic loading rate, and when the ground is saturated or frozen • Based on water balance • Must provide at least 90 days of storage above that required for primary treatment	• Based on the lower of the two rates calculated for soil permeability and nitrogen requirements		• 100 feet to adjacent property • Additional distance may be required where prevailing winds could cause aerosols to drift into residential areas • Buffer zone to be a part of the permitted site	• Applies to multi-purpose use areas such as golf courses • Wastewater to be applied during times of non-use • No wastewater applied in public use areas with high potential for skin to ground contact
Oregon	• Level II - biological treatment and disinfection	• Total coliform sampling - 1 time per week	• Standby power with capacity to fully operate all essential				• 10-foot buffer with surface irrigation • 70-foot buffer	• Includes irrigation of golf courses without

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	• Total coliform - 240/100 ml (2 consecutive samples) - 23/100 ml (7-day median)		treatment processes • Redundant treatment facilities and monitoring equipment to meet required levels of treatment • Alarm devices to provide warning of loss of power and/or failure of process equipment				with spray irrigation • No spray irrigation within 100 feet of drinking fountains or food preparation areas	contiguous residences, cemeteries, highway medians, and landscapes without frequent public access
South Carolina	• Secondary treatment and disinfection • BOD_5 and TSS - 30 mg/l (monthly average) - 45 mg/l (weekly average) • Total coliform - 200/100 ml (monthly average) - 400/100 ml (daily maximum)	• Nitrate monitoring required			• Hydraulic - maximum of 0.5 - 2 in/wk depending on depth to groundwater • A nitrate to nitrogen loading balance may be required • Application rates in excess of 2 in/wk may be approved provided the application is only for a portion of the year; requires a water balance for the summer season	• Required • One well upgradient • Two wells downgradient • A minimum of 9 wells are suggested for each 18 fairways	• 200 feet to surface waters of the state, occupied buildings, and potable water wells • 75 feet to property boundary	• Applies to irrigation of golf courses

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
South Dakota	• Secondary treatment and disinfection • Total coliform - 200/100 ml (geometric mean)			• Minimum of 210 days capacity without consideration for evaporation	• Maximum application rate limited to 2 in/acre/wk or a total of 24 in/acre/yr	• Shallow wells in all directions of major groundwater flow from site and no more than 200 feet outside of the site perimeter, spaced no more than 500 feet apart, and extending into the groundwater table • Shallow wells within the site are also recommended		
Tennessee	• Biological treatment • Additional treatment requirements are determined on a case-by-case basis • Disinfection required • 30 mg/l BOD_5 and TSS (monthly average) • Fecal coliform - 200/100 ml	• Site specific		• Storage requirements determined by either of two methods, 1) use of water balance calculations or, 2) use of a computer program that was developed based upon an extensive NOAA study of climatic variations throughout the United States	• Nitrogen - percolate nitrate-nitrogen not to exceed 10 mg/l • Hydraulic - based on water balance using 5-year return monthly precipitation	• Required	*Surface Irrigation:* • 100 feet to site boundary • 50 feet to onsite streams, ponds, and roads *Spray Irrigation:* [1] Open Fields • 300 feet to site boundary • 150 feet to onsite streams, ponds, and roads [2] Forested • 150 feet to site boundary • 75 feet to onsite streams, ponds, and	• Pertains to irrigation of golf courses, cemeteries, and other public and private land where public use occurs or is expected to occur

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
							roads	
Texas	• Type II reclaimed water *Reclaimed water on a 30-day average to have a quality of:* • 30 mg/l BOD_5 with treatment using pond system • 20 mg/l BOD_5 or 15 mg/l $CBOD_5$ with treatment other than pond system • Fecal coliform - 200/100 ml (geometric mean) - 800/100 ml (not to exceed in any sample)	• Sampling and analysis once per week for BOD_5 or $CBOD_5$ and fecal coliform			• Based on water balance			• Type II reclaimed water use defined as use of reclaimed water where contact between humans and the reclaimed water is unlikely • Uses include irrigation of limited access highway rights-of-way and other areas where human access is restricted or unlikely to occur • Use of reclaimed water for soil compaction and dust control in construction areas where application procedures minimize aerosol drift to public areas also included
Utah	• Type II treated wastewater - secondary	• Weekly composite sampling	• Alternative disposal option or diversion to				• 300 feet to any potable water well	• Uses allowed include irrigation of

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	treatment with disinfection • 25 mg/l BOD (monthly average) • TSS - 25 mg/l (monthly average) - 35 mg/l (weekly mean) • Fecal coliform - 200/100 ml (weekly median) - 800/100 ml (not to exceed in any sample) • pH 6 – 9	required for BOD • Daily composite sampling required for TSS • Daily monitoring of fecal coliform • pH monitored continuously or by daily grab samples	storage required in case quality requirements not met				• 300 feet to areas intended for public access • Impoundments at least 500 feet from any potable water well • Public access to effluent storage and irrigation or disposal sites to be restricted by a stocktight fence or other comparable means	highway rights-of-way and other areas where human access is restricted or unlikely to occur • Also allows use of reclaimed water for soil compaction or dust control in construction areas
Washington	• Class C - oxidized and disinfected • Total coliform - 23/100 ml (7-day mean) - 240/100 ml (single sample) *General compliance requirements:* • 30 mg/l BOD and TSS (monthly mean) • Turbidity - 2 NTU (monthly) - 5 NTU (not to exceed at any time) • Minimum	• BOD – 24-hour composite samples collected at least weekly • TSS – 24-hour composite samples collected at least daily • Total coliform and dissolved oxygen - grab samples collected at least daily • Continuous on-line monitoring of turbidity	• Warning alarms independent of normal power supply • Back-up power source • Emergency storage: short-term, 1 day; long-term, 20 days • Multiple treatment units or storage or disposal options • Qualified personnel available or on call at all times the irrigation	• Storage required when no approved alternative disposal system exists • Storage volume established by determining storage period required for duration of a 10-year storm, using a minimum of 20 years of climatic data • At a minimum, system storage capacity should be the	• Hydraulic loading rate to be determined based on a detailed water balance analysis	• May be required • Monitoring program will be based on reclaimed water quality and quantity, site specific soil and hydrogeologic characteristics, and other considerations	• 50 feet to areas accessible to the public and use area property line • 100 feet to any potable water supply well	• Uses include irrigation of restricted access areas such as freeway landscapes, or other areas where the public has similar access or exposure to the reclaimed water

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Table A-2. Restricted Urban Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	chlorine residual of 1 mg/l after a contact time of 30 minutes		system is operating	volume equal to 3 times that portion of the average daily flow for which no alternative reuse or disposal system is permitted				
Wyoming	• Minimum of Class B wastewater-secondary treatment and disinfection • Fecal coliform - greater than 2.2/100 ml but less than 200/100 ml	• Treated wastewater to be analyzed for fecal coliform, nitrate as N, ammonia as N, and pH at a minimum • Monitoring frequency - once per month for lagoon systems - once per week for mechanical systems • Frequency specified in NPDES permit required if more frequent	• Multiple units and equipment • Alternative power sources • Alarm systems and instrumenta-tion • Operator certification and standby capability • Bypass and dewatering capability • Emergency storage	• Emergency storage	• Will be applied for the purpose of beneficial reuse and will not exceed the irrigation demand of the vegetation at the site • Not to be applied at a rate greater than the agronomic rate for the vegetation at the site • Will be applied in a manner and time that will not cause any surface runoff or contamination of a groundwater aquifer		• 30 feet to adjacent property lines • 30 feet to all surface waters • 100 feet to all potable water supply wells	• Pertains to land that is accessible to the public but with limited access during irrigation periods

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
Arizona	*Class A reclaimed water:* • Secondary treatment, filtration and disinfection • Chemical feed facilities required to add coagulants or polymers if necessary to meet turbidity criterion • Turbidity - 2 NTU (24-hour average) - 5 NTU (not to exceed at any time) • Fecal coliform - none detectable in 4 of last 7 daily samples - 23/100 ml (single sample maximum) *Class B reclaimed water:* • Secondary treatment and disinfection • Fecal coliform - 200/100 ml (not to exceed in 4 of the last 7 daily	• Case-by-case basis			• Application rates based on either the water allotment assigned by the Arizona Department of Water Resources (a water balance that considers consumptive use of water by the crop, turf, or landscape vegetation) or an alternative approved method			• Class A reclaimed water required for spray irrigation of food crops and orchards or vineyards • Class B reclaimed water suitable for surface irrigation of orchards or vineyards

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	samples) - 800/100 ml (single sample maximum)							
Arkansas	• Primary treatment	• As required by regulatory agency		• Based on water balance using divisional average annual 90 percentile rainfall	• Hydraulic - 0.5 to 4.0 in/wk • Nitrogen - percolate nitrate-nitrogen not to exceed 10 mg/l	• Required • One well upgradient • 1 well within site • One well downgradient • More wells may be required on a case-by-case basis	*Spray irrigation:* • 200 feet • 1,320 feet to populated area *Non-spray system:* • 50 feet • 660 feet to populated area	• Pertains to processed food crops only and evaluated on a case-by-case basis • Irrigation of raw food crops is not permitted
California	*Disinfected tertiary recycled water:* • Oxidized, coagulated (not required if membrane filtration is used and/or turbidity requirements are met), filtered, disinfected • Total coliform - 2.2/100 ml (7-day median) - 23/100 ml (not to exceed in more than one sample in any 30-day	*Disinfected tertiary recycled water:* • Total coliform - sampled at least once daily from the disinfected effluent • Turbidity - continuously sampled following filtration *Disinfected secondary-2.2 recycled water:* • Total coliform - sampled at least once daily from the disinfected	• Warning alarms • Back-up power source • Multiple treatment units capable of treating entire flow with one unit not in operation or storage or disposal provisions • Emergency storage or disposal: short-term, 1 day; long-term, 20 days • Sufficient number of				• No irrigation with disinfected tertiary recycled water within 50 feet of any domestic water supply well unless certain conditions are met • No impoundment of disinfected tertiary recycled water within 100 feet of any domestic water supply well • No irrigation	• Disinfected tertiary recycled water can be used for irrigation of food crops where recycled water comes into contact with edible portion of crop • Disinfected secondary-2.2 recycled water can be used for irrigation of food crops where edible portion is produced above ground and not

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	period) - 240/100 ml (maximum any one sample) • Turbidity requirements for wastewater that has been coagulated and passed through natural undisturbed soils or a bed of filter media - maximum average of 2 NTU within a 24-hour period - not to exceed 5 NTU more than 5 percent of the time within a 24-hour period - maximum of 10 NTU at any time • Turbidity requirements for wastewater passed through membrane - not to exceed 0.2 NTU more than 5 percent of the time within a	effluent	qualified personnel				with, or impoundment of, disinfected secondary-2.2 recycled water within 100 feet of any domestic water supply well • No irrigation with, or impoundment of, undisinfected secondary recycled water within 150 feet of any domestic water supply well • No spray irrigation of any recycled water, other than disinfected tertiary recycled water, within 100 feet of a residence or a place where public exposure could be similar to that of a park, playground, or schoolyard	contacted by the recycled water • Undisinfected secondary recycled water can be used for irrigation of orchards and vineyards where recycled water does not come into contact with edible portion of crop and food crops that must undergo commercial pathogen-destroying processing before consumption

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	24-hour period - maximum of 0.5 NTU at any time *Disinfected secondary-2.2 recycled water:* • Oxidized and disinfected • Total coliform - 2.2/100 ml (7-day median) - 23/100 ml (not to exceed in more than one sample in any 30-day period) *Undisinfected secondary recycled water:* • Oxidized wastewater							
Colorado	*Consumed raw:* [1] Surface irrigation • Oxidized and disinfected • Total coliform - 2.2/100 ml (7-day median) • Not acceptable for root crops or crops where edible portions contact ground [2] Spray						• 500 feet to domestic supply well • 100 feet to any irrigation well • Setback from property lines based upon use of adjoining property	

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	irrigation • Oxidized, coagulated, clarified, filtered, and disinfected • Total coliform - 2.2/100 ml (7-day median) *Processed food:* • Oxidized and disinfected • Total coliform - 23/100 ml (7-day median) *Orchards & Vineyards:* [1] Surface irrigation • Oxidized and disinfected • Total coliform - 23/100 ml (7-day median) • Edible portion of plant cannot contact ground [2] Spray irrigation • Oxidized, coagulated, clarified, filtered, and disinfected • Total coliform - 2.2/100 ml (7-day median)							
Florida	• Secondary	• Parameters to	• Class I	• At a minimum,	• Site specific	• Required	• 75 feet to	• Direct contact

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	treatment with filtration and high-level disinfection • Chemical feed facilities to be provided • 20 mg/l $CBOD_5$ (annual average) • 5 mg/l TSS (single sample) • Total chlorine residual of at least 1 mg/l after a minimum acceptable contact time of 15 minutes at peak hourly flow • Fecal coliform - over 30-day period, 75 percent of samples below detection limits - 25/100 ml (single sample) • pH 6 - 8.5 • Limitations to be met after disinfection	be monitored and sampling frequency to be identified in wastewater facility permit • Minimum schedule for sampling and testing based on system capacity established for flow, pH, chlorine residual, dissolved oxygen, suspended solids, $CBOD_5$, nutrients, and fecal coliform • Continuous on-line monitoring of turbidity prior to disinfection • Continuous on-line monitoring of total chlorine residual or residual concentrations of other disinfectants • Monitoring for *Giardia* and	reliability - requires multiple or back-up treatment units and a secondary power source • Minimum reject storage capacity equal to 1-day flow at the average daily design flow of the treatment plant or the average daily permitted flow of the reuse system, whichever is less • Minimum system size of 0.1 mgd (not required for toilet flushing and fire protection uses) • Staffing - 24 hrs/day, 7 days/wk or 6 hrs/day, 7 days/wk with diversion of reclaimed water to reuse	system storage capacity shall be the volume equal to three times the portion of the average daily flow for which no alternative reuse or disposal system is permitted • Water balance required with volume of storage based on a 10-year recurrence interval and a minimum of 20 years of climatic data • Not required if alternative system is incorporated into the system design to ensure continuous facility operation • Existing or proposed lakes or ponds (such as golf course ponds) are	• Design hydraulic loading rate - maximum annual average of 2 in/wk is recommended • Based on nutrient and water balance assessments	• One upgradient well located as close as possible to the site without being affected by the site's discharge (background well) • One well at the edge of the zone of discharge downgradient of the site (compliance well) • One well downgradient from the site and within the zone of discharge (intermediate well) • One well located adjacent to unlined storage ponds or lakes • Other wells may be required depending on site-specific	potable water supply wells • 75 feet from reclaimed water transmission facility to public water supply well • Low trajectory nozzles required within 100 feet of outdoor public eating, drinking, and bathing facilities • 200 feet from unlined storage ponds to potable water supply wells	irrigation of edible crops that will not be peeled, skinned, cooked, or thermally processed before consumption is not allowed except for tobacco and citrus • Indirect application methods that preclude direct contact with the reclaimed water can be used for irrigation of any edible crop • Citrus irrigation systems will only require secondary treatment and basic disinfection if public access will be restricted, the reclaimed water does not directly contact the fruit, and

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
		Cryptosporidium based on treatment plant capacity - ≥ 1 mgd, sampling one time during each two-year period - < 1 mgd , sampling one time during each 5 year period - samples to be taken immediately following disinfection process • Primary and secondary drinking water standards to be monitored by facilities ≥ 100,000 gpd	system only during periods of operator presence	appropriate for storage if it will not impair the ability of the lakes or ponds to function as a stormwater management system • Aquifer storage and recovery allowed as provision of storage		criteria • Quarterly monitoring required for water level, nitrate, total dissolved solids, arsenic, cadmium, chloride, chromium, lead, fecal coliform, pH, and sulfate • Monitoring may be required for additional parameters based on site-specific conditions and groundwater quality		the fruit produced is processed before human consumption
Hawaii	*R-1 water:* • Oxidized, filtered, and disinfected • Fecal coliform - 2.2/100 ml (7-day median) - 23/100 ml (not to exceed in more than one sample in	• Daily flow monitoring • Continuous turbidity monitoring prior to and after filtration process • Continuous measuring and recording of	• Multiple or standby units required with sufficient capacity to enable effective operation with any one unit out of service • Alarm devices	• 20 days storage required unless it can be demonstrated that another time period is adequate or that no storage is necessary	• Design application rate determined by water balance	• Required • Groundwater monitoring system may consist of a number of lysimeters and/or monitoring wells depending on	*R-1 water:* • Minimum of 50 feet to drinking water supply well • Outer edge of impoundment at least 100 feet from any drinking water supply well	• R-1 water can be used for spray irrigation of food crops above ground and not contacted by irrigation and orchards and vineyards bearing food

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	any 30-day period) - 200/100 ml (maximum any one sample) • Inactivation and/or removal of 99.999 percent of the plaque-forming units of F-specific bacteriophage MS2, or polio virus • Detectable turbidity not to exceed 5 NTU for more than 15 minutes and never to exceed 10 NTU prior to filtration • Effluent turbidity not to exceed 2 NTU • Chemical pretreatment facilities required in all cases where granular media filtration is used; not required for facilities using membrane	chlorine residual • Daily monitoring of fecal coliform • Weekly monitoring of BOD_5 and suspended solids	required for loss of power, high water levels, failure of pumps or blowers, high head loss on filters, high effluent turbidity, loss of coagulant or polymer feed, and loss of chlorine residual • Standby power source required for treatment plant and distribution pump stations	• Storage requirements based on water balance using at least a 30-year record • Reject storage required with a volume equal to 1 day of flow at the average daily design flow • Emergency system storage not required where an alternate effluent disposal system has been approved		site size, site characteristics, location, method of discharge, and other appropriate considerations • One well upgradient and two wells downgradient for project sites 500 acres or more • One well within the wetted field area for each project whose surface area is greater than or equal to 1,500 acres • One lysimeter per 200 acres • One lysimeter for project sites that have greater than 40 but less than 200 acres • Additional lysimeters may be necessary to address concerns of public health or environmental	*R-2 water:* • For spray irrigation applications, 500 feet to residence property or a place where public exposure could be similar to that at a park, elementary schoolyard or athletic field • Minimum of 100 feet to any drinking water supply well • Outer edge of impoundment at least 300 feet from any drinking water supply well *R-3 water:* • Minimum of 150 feet to drinking water supply well • Outer edge of impoundment at least 1000 feet to any drinking water supply well	crops • R-2 water can be used for spray irrigation of food crops undergoing commercial pathogen destroying process before consumption, as well as orchards and vineyards not bearing food crops during irrigation • R-2 water can be used for subsurface irrigation of food crops above ground and not contacted by irrigation • R-3 water can be used for drip, surface, or subsurface irrigation of food crops undergoing commercial pathogen process before consumption (no later than

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	filtration • Theoretical chlorine contact time of 120 minutes and actual modal contact time of 90 minutes throughout which the chlorine residual is 5 mg/l *R-2 water:* • Oxidized and disinfected • Fecal coliform - 23/100 ml (7-day median) - 200/100 ml (not to exceed in more than one sample in any 30-day period) • Theoretical chlorine contact time of 15 minutes and actual modal contact time of 10 minutes throughout which the chlorine residual is					protection as related to variable characteristics of the subsurface or of the operations of the project		30 days before before harvest), orchards and vineyards bearing food crops and orchards and vineyards not bearing food crops during irrigation • R-2 water used in spray irrigation will be performed when the area is closed to the public and the public is absent from the area, and will end at least 1 hour before the area is open to the public • Subsurface irrigation may be performed at any time

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	0.5 mg/l *R-3 water:* • Oxidized wastewater							
Idaho	*Raw food crops where reclaimed water contacts edible portion:* • Oxidized, coagulated, clarified, filtered, and disinfected • Total coliform - 2.2/100 ml (7-day median) *Raw food crops where reclaimed water only contacts unedible portion:* • Oxidized and disinfected • Total coliform - 2.2/100 ml (7-day median) *Processed foods and orchards & vineyards with no direct contact of reclaimed water:* [1] Unrestricted public access • Disinfected primary effluent • Total coliform - 230/100 ml							

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [(1)]	Other
	(7-day median) [2] Restricted public access • Primary effluent							
Indiana	• Secondary treatment and disinfection • 10 mg/l BOD_5 • 5 mg/l TSS prior to disinfection (24 hour average) • Fecal coliform - no detectable fecal coliform (7-day median) - 14/100 ml (single sample) • pH 6 - 9 • Total chlorine residual at least 1 mg/l after a minimum contact time of 30 minutes (if chlorination is used for disinfection)	• Daily monitoring of TSS, coliform, and chlorine residual • Weekly monitoring of BOD and pH • Monthly monitoring of total nitrogen, ammonium nitrogen, nitrate nitrogen, phosphorus, and potassium • Annual monitoring of arsenic, cadmium, copper, lead, mercury, nickel, selenium, and zinc	• Alternate power source required	• Minimum of 90 days effective storage capacity required	• Maximum hydraulic loading rate of 2 in/week		• 200 feet to potable water supply wells or drinking water springs • 300 feet to any waters of the state • 300 feet to any residence	• Food crops not to be harvested for 14 months after land application of wastewater if the harvested part touches the ground and has no harvested parts below the soil surface • Food crops not to be harvested for 38 months after land application of wastewater if harvested parts are below the soil surface • Otherwise, food crops not to be harvested for 30 days after land application of wastewater

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
Kansas	• Secondary treatment with periodic discharge to surface waters • Primary treatment with no discharge to surface water			• Storage provided to retain a minimum of 900 days average dry weather flow when no discharge to surface water is available	• Maximum daily application rate of 3 in/ac/day • Maximum annual application rate of 40 in/acre • Based on soil and crop moisture and/or nutrient requirements of selected crop	• Site specific	• 500 feet to residential areas • 200 feet to wells and water supplies not on site property • 100 feet to adjacent properties • Groundwater table a depth of at least 10 feet beneath application area	• Irrigation of unprocessed food for direct human consumption prohibited
Michigan	• pH 5.5 - 10 • 20 mg/l total inorganic nitrogen • 0.5 mg/l nitrite • 5 mg/l phosphorus • 1 mg/l phosphorus if surface water body is downgradient within 1,000 feet • Aluminum, 150 ug/l • Chloride, 250 mg/l • Sodium, 150 mg/l • Sulfate,	• Flow measurement • Grab samples collected and analyzed twice each month for ammonia-nitrogen, nitrate-nitrogen, nitrite-nitrogen, sodium, chloride, phosphorus, and pH			• Daily, monthly, or annual design hydraulic loading rate shall not be more than 7 percent of the permeability of the most restrictive soil layer within the solum as determined by the saturated hydraulic conductivity method or 12 percent of the permeability as determined by	• May be required • Monitoring requirements specific to each site	• 100 feet to property lines	• Irrigated crops for human consumption shall be limited to those requiring processing prior to consumption • Allows irrigation of vegetated areas between May 1 and October 15 • Governed by Michigan Department of Environmental Quality issued groundwater

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	250 mg/l • Iron, 300 ug/l • Manganese, 50 ug/l • THM limits • Treatment technology standards for certain organic substances • Additional effluent criteria determined on a case-by-case basis				the basin infiltration method • Annual hydraulic loading rate shall not be more than 3 percent of the permeability of the solum when determined by either the cylinder infiltration method or air entry permeameter test method			discharge permits • Categorized as slow rate land treatment
Montana	• Oxidized, clarified, coagulated, filtered, and disinfected • 10 mg/l or less of BOD and TSS • Fecal coliform - 23/100 ml (single sample in any 30-day period) • Turbidity - 2 NTU (average) - 5 NTU (not to exceed more	• Effluent to be monitored on a regular basis to show the biochemical and bacteriological quality of the applied wastewater • Monitoring frequency to be determined on a case-by-case basis			• Nitrogen and hydraulic loadings determined based on methods in EPA Manual 625/1-81-013 • Hydraulic loading must be based on the wettest year in ten years	• Determined on a case-by-case basis • Consideration is given to groundwater characteristics, past practices, depth to groundwater, cropping practices, etc.	• 100 feet to any water supply well • Distance to surface water determined on a case-by-case basis based on quality of effluent and the level of disinfection	• Reduction to reclaimed water quality requirements may be considered for food crops which undergo extensive commercial, physical, or chemical processing sufficient to destroy pathogenic agents before it is suitable for

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	than 5 percent of the time during any 24-hour period)							human consumption
Nevada	• At a minimum, secondary treatment with disinfection • 30 mg/l BOD_5 • Fecal coliform - 200/100 ml (30-day geometric mean) - 400/100 ml (maximum daily number)						• None required	• Only surface irrigation of fruit or nut bearing trees permitted
New Jersey	• Fecal coliform - 2.2/100 ml (7-day median) - 14/100 ml (maximum any one sample) • Minimum chlorine residual - 1.0 mg/l after 15-minute contact at peak hourly flow • Alternative methods of disinfection, such as UV and ozone, may be approved • TSS not to	• Continuous on-line monitoring of chlorine residual produced oxidant at the compliance monitoring point • For spray irrigation, chlorination levels for disinfection should be continually evaluated to ensure chlorine residual levels		• Not required when another permitted reuse system or effluent disposal system is incorporated into the system design • If system storage ponds are used, they do not have to be lined • Reject storage ponds shall be lined or sealed to prevent measurable seepage	• Hydraulic loading rate - maximum annual average of 2 in/wk but may be increased based on a site-specific evaluation • The spray irrigation of reclaimed water shall not produce surface runoff or ponding		• 75 feet to potable water supply wells that are existing or have been approved for construction • 75 feet provided from a reclaimed water transmission facility to all potable water supply wells • 100 feet from outdoor public eating, drinking, and bathing	• Irrigation of edible crops that will be peeled, skinned, cooked, or thermally processed before consumption is allowed • An indirect method that precludes direct contact with the reclaimed water (such as ridge and furrow irrigation) is

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	exceed 5 mg/l before disinfection • Total nitrogen - 10 mg/l but may be less stringent if higher limit is still protective of environment • Secondary • Filtration • Chemical addition prior to filtration may be necessary • A chlorine residual of 0.5 mg/l or greater is recommended to reduce odors, slime, and bacterial re-growth	do not adversely impact vegetation • Continuous monitoring for turbidity before disinfection is required • Operating protocol required • User/Supplier Agreement • Annual usage report • Annual inventory submittal on commercial operations using reclaimed water to irrigate edible crop		• Existing or proposed ponds (such as golf course ponds) are appropriate for storage of reuse water if the ability of the ponds to function as stormwater management systems is not impaired			facilities • 100 feet between indoor aesthetic features and adjacent indoor public eating and drinking facilities when in the same room or building	permitted for edible crops that will not be peeled, skinned, cooked, or thermally processed before consumption • Secondary treatment for the purpose of the manual refers to the existing treatment requirements in the NJPDES permit, not including the additional reclaimed water for beneficial reuse treatment requirements
New Mexico	• Adequately treated and disinfected • Fecal coliform – 1,000/100 ml	• Fecal coliform sample taken at point of diversion to irrigation system						• Only surface irrigation on food crops with no contact of reclaimed water on edible portion is permitted
Oklahoma	• Primary treatment		• Standby power required for	• Required for periods when	• Based on the lower of the		• 100 feet to adjacent	• Use not allowed on

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
			continuity of operation during power failures	available wastewater exceeds design hydraulic loading rate, and when the ground is saturated or frozen • Based on water balance • Must provide at least 90 days of storage above that required for primary treatment	two rates calculated for soil permeability and nitrogen requirements		property • Additional distance may be required where prevailing winds could cause aerosols to drift into residential areas • Buffer zone to be a part of the permitted site	food crops that can be eaten raw • May be used for irrigation of crops such as corn, wheat, and oats, provided a period of 30 days elapses between last application and harvest
Oregon	*Unprocessed food :* • Level IV - biological treatment, clarification, coagulation, filtration, and disinfection • Total coliform - 2.2/100 ml (7-day median) - 23/100 ml (maximum any sample) • Turbidity - 2 NTU (24-hour mean)	*Unprocessed food:* • Total coliform sampling - once a day • Turbidity - hourly *Processed food crops and orchards and vineyards:* • Total coliform sampling - once a week	• Standby power with capacity to fully operate all essential treatment processes • Redundant treatment facilities and monitoring equipment to meet required levels of treatment • Alarm devices to provide warning of loss of power and/or failure				*Unprocessed food:* • None required *Processed food and orchards and vineyards:* • 10 foot buffer for surface irrigation • 70 foot buffer for spray irrigation	• Surface irrigation required for orchards and vineyards • No irrigation of processed food crops and orchards and vineyards 3 days prior to harvesting

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	- 5 NTU (5 percent of time during 24-hour period) *Processed food crops and orchards and vineyards:* • Level II - biological treatment and disinfection • Total coliform - 240/100 ml (2 consecutive samples) - 23/100 ml (7-day median)		of process equipment					
Texas	*Direct contact with edible portion of crop unless food crop undergoes pasteurization process* • Type I reclaimed water *Reclaimed water on a 30 day average to have a quality of:* • 5 mg/l BOD_5 or $CBOD_5$ • 10 mg/l for landscape impoundment • Turbidity	*Direct contact with edible portion of crop unless food crop undergoes pasteurization process* • Sampling and analysis twice per week for BOD_5 or $CBOD_5$, turbidity, and fecal coliform *Direct contact with edible portion of crop not likely or where food crop undergoes*			• Based on water balance			• Spray irrigation not permitted on food crops that may be consumed raw • Other types of irrigation that avoid contact of reclaimed water with edible portions of food crops are acceptable • Food crops that will be substantially processed prior to human consumption may be spray

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	- 3 NTU • Fecal coliform - 20/100 ml (geometric mean) - 75/100 ml (not to exceed in any sample) *Direct contact with edible portion of crop not likely or where food crop undergoes pasteurization* • Type II reclaimed water *Reclaimed water on a 30-day average to have a quality of:* • 30 mg/l BOD_5 with treatment using pond system • 20 mg/l BOD_5 or 15 mg/l $CBOD_5$ with treatment other than pond system • Fecal coliform - 200/100 ml (geometric mean) - 800/100 ml (not to exceed	*pasteurization* • Sampling and analysis once per week for BOD_5 or $CBOD_5$ and fecal coliform						irrigated

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	in any sample)							
Utah	*Spray irrigation of food crops:* • Type I treated wastewater - secondary treatment with filtration and disinfection • 10 mg/l BOD (monthly average) • Turbidity prior to disinfection - not to exceed 2 NTU (daily average) - not to exceed 5 NTU at any time • Fecal coliform - none detected (weekly median as determined from daily grab samples) - 14/100 ml (not to exceed in any sample) • 1.0 mg/l total residual chlorine after 30 minutes contact time at peak flow • pH 6 - 9	*Spray irrigation of food crops:* • Daily composite sampling required for BOD • Continuous turbidity monitoring prior to disinfection • Daily monitoring of fecal coliform • Continuous total residual chlorine monitoring • pH monitored continuously or by daily grab samples *Surface irrigation of food crops:* • Weekly composite sampling required for BOD • Daily composite sampling required for TSS • Daily monitoring of	• Alternative disposal option or diversion to storage required in case quality requirements not met				*Spray irrigation of food crops:* • 50 feet to any potable water well • Impoundments at least 500 feet from any potable water well *Surface irrigation of food crops:* • 300 feet to any potable water well • Impoundments at least 500 feet from any potable water well • Public access to effluent storage and irrigation or disposal sites to be restricted by a stocktight fence or other comparable means	• Type I treated wastewater required for spray irrigation of food crops where the applied reclaimed water is likely to have direct contact with the edible part • Type II treated wastewater required for irrigation of food crops where the applied reclaimed water is not likely to have direct contact with the edible part, whether the food will be processed or not (spray irrigation not allowed)

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	Surface irrigation of food crops: • Type II treated wastewater - secondary treatment with disinfection • 25 mg/l BOD (monthly average) • TSS - 25 mg/l (monthly average) - 35 mg/l (weekly mean) • Fecal coliform - 200/100 ml (weekly median) – 800/100 ml (not to exceed in any sample) • pH 6 - 9	fecal coliform • pH monitored continuously or by daily grab samples						
Washington	*Spray irrigation of food crops or surface irrigation of root crops:* • Class A - oxidized, coagulated, filtered, and disinfected • Total coliform - 2.2/100 ml (7-day mean) - 23/100 ml (single sample)	• BOD – 24-hour composite samples collected at least weekly • TSS – 24-hour composite samples collected at least daily • Total coliform and dissolved oxygen - grab samples	• Warning alarms independent of normal power supply • Back-up power source • Emergency storage: short-term, 1 day; long-term, 20 days • Multiple	• Storage required when no approved alternative disposal system exists • Storage volume established by determining storage period required for duration of a 10-year storm,	• Hydraulic loading rate to be determined based on a detailed water balance analysis	• May be required • Monitoring program will be based on reclaimed water quality and quantity, site specific soil and hydrogeologic characteristics, and other considerations	*Spray irrigation of food crops or surface irrigation of root crops:* • 50 feet to any potable water supply well *Surface irrigation of food crops:* • 50 feet to areas accessible to the public and the use area	• No orchard or vineyard fruit may be harvested that has come in contact with the irrigating water or the ground • Effluent quality requirements for processed food determined on

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	Surface irrigation of food crops: • Class B - oxidized and disinfected • Total coliform - 2.2/100 ml (7-day mean) - 23/100 ml (single sample) *Irrigation of foods crops that undergo processing or surface irrigation of orchards and vineyards:* • Class D - oxidized and disinfected • Total coliform - 240/100 ml (7-day mean) *General compliance requirements:* • 30 mg/l BOD and TSS (monthly mean) • Turbidity - 2 NTU (monthly) - 5 NTU (not to exceed at any time) • Minimum chlorine	collected at least daily • Continuous on-line monitoring of turbidity	treatment units or storage or disposal options • Qualified personnel available or on call at all times the irrigation system is operating	using a minimum of 20 years of climatic data • At a minimum, system storage capacity should be the volume equal to 3 times that portion of the average daily flow for which no alternative reuse or disposal system is permitted			property line • 100 feet to any potable water supply *Irrigation of food crops that undergo processing or surface irrigation of orchards and vineyards:* • 100 feet to areas accessible to the public and the use area property line • 300 feet to any potable water supply	a case-by-case basis

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	residual of 1 mg/l after a contact time of 30 minutes							
West Virginia	• Secondary treatment and disinfection • 30 mg/l BOD • 30 mg/l TSS	• Frequency of reporting determined on a case-by-case basis		• Minimum of 90 days storage to be provided	• Hydraulic - maximum application rates of 0.25 in/hr 0.50 in/day 2.0 in/wk	• Minimum of one well between project site and public well(s) or high capacity private wells • Minimum of one well in each direction of groundwater movement	• Fence to be placed at least 50 feet beyond spray area • 350 feet from fence to adjacent property lines or highways unless low trajectory spray and/or physical buffers are provided	• Analysis of crop required if used for human consumption
Wyoming	• Minimum of Class B wastewater - secondary treatment and disinfection • Fecal coliform - greater than 2.2/100 ml but less than 200/100 ml	• Treated wastewater to be analyzed for fecal coliform, nitrate as N, ammonia as N, and pH at a minimum • Monitoring frequency - once per month for lagoon systems - once per week for mechanical systems	• Multiple units and equipment • Alternative power sources • Alarm systems and instrumenta-tion • Operator certification and standby capability • Bypass and dewatering capability • Emergency storage	• Emergency storage	• Will be applied for the purpose of beneficial reuse and will not exceed the irrigation demand of the vegetation at the site • Not to be applied at a rate greater than the agronomic rate for the vegetation at the site • Will be applied in a manner		• 30 feet to adjacent property lines • 30 feet to all surface waters • 100 feet to all potable water supply wells	• Food crops not to be harvested for 30 days after application of treated wastewater

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Table A-3. Agricultural Reuse – Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
		• Frequency specified in NPDES permit required if more frequent			and time that will not cause any surface runoff or contamination of a groundwater aquifer			

(1) Distances are from edge of wetted perimeter unless otherwise noted.

Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
Alabama	• Minimum EPA secondary, or equivalent to secondary, limits and appropriate disinfection • If wastewater stabilization pond is used, pond must meet ADEM requirements with second cell being used as a holding pond • Mechanical systems, if used, should allow as little nitrification as possible		• Controls required to indicate any system malfunction or permit varied field operations	• Based on water balance performed on a monthly basis with a precipitation input using a 5-year, 24-hour rainfall event, 30-year minimum base period • In addition to storage dictated by water balance, a minimum of 15 days storage should be provided for contingencies	• Based on soil permeability and nitrogen limits (10 mg/l nitrate) • Excessive rainwater run-off should be diverted • Excessive ponding should be avoided	• At least three downgradient monitoring wells • At least one upgradient monitoring well • Contaminants in groundwater not to exceed primary and secondary maximum contaminant levels • Minimum depth to groundwater, without use of an underdrain collection system, shall be 4 feet	• 100 feet to property lines • 300 feet to existing habitable residences • Spray irrigation not allowed within 100 feet of any perennial lake or stream • If irrigation causes an intermittent stream to become perennial, the irrigation must cease within 100 feet of the stream • Spray irrigation not allowed in wellhead protection area (WHPA 1) - if no wellhead delineation exists, minimum distance for application shall be 1,000 feet or as required • No sites within 100 year floodplain	• Categorized as a form of land treatment defined as use of a vegetation-soil system to both renovate and serve as the ultimate receiver of treated wastewater
Alaska	• Secondary							• Categorized as

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	treatment, and if discharge is potential health hazard, disinfection • BOD_5 and TSS from source other than stabilization pond - 30 mg/l (30-day average) - 45 mg/l (7-day average) - 60 mg/l (24-hour average) • BOD_5 from stabilization pond - 45 mg/l (30-day average) and a percent removal that is not less than 65 percent by weight - 65 mg/l (7-day average) • Suspended solids from stabilization pond - 70 mg/l (30-day average) • pH 6 - 9							land surface disposal defined as disposal of treated wastewater onto the surface of the land in area suitable for that purpose

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
Arizona	*Class B reclaimed water:* • Secondary treatment and disinfection • Fecal coliform - 200/100 ml (not to exceed in 4 of the last 7 daily samples) - 800/100 ml (single sample maximum) *Class C reclaimed water:* • Secondary treatment in a series of wastewater stabilization ponds, including aeration, with or without disinfection • Minimum total retention time of 20 days • Fecal coliform - 1,000/100 ml (not to exceed in 4 of the last 7 daily samples) - 4,000/100 ml (single sample maximum)	• Case-by-case basis			• Application rates based on either the water allotment assigned by the Arizona Department of Water Resources (a water balance that considers consumptive use of water by the crop, turf, or landscape vegetation) or an alternative approved method			• Class B reclaimed water may be used for irrigation of pasture for milking animals and livestock watering (dairy animals) • Class C reclaimed water can be used for irrigation of pasture for non-dairy animals; livestock watering (non-dairy animals); irrigation of sod farms, fiber, seed, forage, and similar crops; and silviculture
Arkansas	• Primary treatment • Disinfection			• Based on water balance using divisional	• Hydraulic - 0.5 to 4.0 in/wk • Nitrogen -	• Required • One well upgradient	*Spray irrigation:* • 200 feet • 1,320 feet to	

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	also required when irrigating dairy cattle pasture land			average annual 90 percentile rainfall	percolate nitrate-nitrogen not to exceed 10 mg/l	• 1 well within site • One well downgradient • More wells may be required on a case-by-case basis	populated area *Non-spray system:* • 50 feet • 660 feet to populated area	
California	*Ornamental nursery stock and sod farms where access by general public is not restricted, pasture for milking animals, and any nonedible vegetation where access is controlled so that the irrigated area cannot be used as if it were part of a park, playground, or schoolyard* • Disinfected secondary-23 recycled water-oxidized and disinfected • Total coliform - 23/100 ml (7-day median) - 240/100 ml (not to exceed in more than one sample in any 30-day	*Disinfected secondary-23 recycled water* • Total coliform – sampled at least once daily from the disinfected effluent	• Warning alarms • Back-up power source • Multiple treatment units capable of treating entire flow with one unit not in operation or storage or disposal provisions • Emergency storage or disposal: short-term, 1 day; long-term, 20 days • Sufficient number of qualified personnel				• No irrigation with, or impoundment of, disinfected secondary-23 recycled water within 100 feet of any domestic water supply well • No irrigation with, or impoundment of, undisinfected secondary recycled water within 150 feet of any domestic water supply well • No spray irrigation within 100 feet of a residence or a place where public exposure could be similar to that of a park, playground, or schoolyard	• Irrigation of ornamental nursery stock and sod farms will be allowed provided no irrigation with recycled water occurs for a period of 14 days prior to harvesting, retail sale, or access by the general public

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	period) *Non food-bearing trees, ornamental nursery stock and sod farms, fodder and fiber crops, pasture for animals not producing milk for human consumption, and seed crops not eaten by humans:* • Undisinfected secondary recycled water-oxidized wastewater							
Colorado	• Oxidized and disinfected • Total coliform - 23/100 ml (7-day median)						• 500 feet to domestic supply well • 100 feet to any irrigation well • Setback from property lines based upon use of adjoining property	• Includes irrigation of pastures for milking animals
Delaware	• Biological treatment and disinfection • BOD_5 - 50 mg/l at average design flow - 75 mg/l at peak flow • TSS	• Parameters which may require monitoring include volume of water applied to spray fields, BOD, suspended		• Storage provisions required either as a separate facility or incorporated into the pretreatment system • Minimum 15	• Maximum design wastewater loadings limited to 2.5 in/week • Maximum instantaneous wastewater application	• Required • One well upgradient of site or otherwise outside the influence of the site for background monitoring	• 150 feet to all property boundaries and the shoulder of internal and external public roads • 100 feet to perennial lake	• Regulations pertain to sites closed to public access

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	- 50 mg/l for mechanical systems - 90 mg/l for ponds • Fecal coliform - not to exceed 200/100 ml at all times	solids, fecal coliform bacteria, pH, COD, TOC, ammonia nitrogen, nitrate nitrogen, total Kjeldahl nitrogen, total phosphorus, chloride, Na, K, Ca, Mg, metals, and priority pollutants • Parameters and sampling frequency determined on a case-by-case basis		days storage required unless other measures for controlling flow are demonstrated • Must determine operational, wet weather, and water balance storage requirements	rates limited to 0.25 in/hour • Design wastewater loading must be determined as a function of precipitation, evapotrans-piration, design percolation rate, nitrogen loading and other constituent loading limitations, groundwater and drainage conditions, and average and peak design wastewater flows and seasonal fluctuations	• One well within wetted field area of each drainage basin intersected by site • Two wells downgradient in each drainage basin intersected by site • One well upgradient and 1 well downgradient of the pond treatment and storage facilities in each drainage basin intersected by site • May require measurement of depth to groundwater, pH, COD, TOC, nitrate nitrogen, total phosphorus, electrical conductivity, chloride, fecal coliform bacteria, metals, and priority pollutants • Parameters	or stream • 50 feet to edge of channelized, intermittent watercourse • If irrigation causes intermittent watercourse to become perennial, 100-foot buffer requirement will apply • Wetland buffers determined on a case-by-case basis	

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
						and sampling frequency determined on a case-by-case basis		
Florida	• Secondary treatment and basic disinfection • 20 mg/l $CBOD_5$ and TSS (annual average) • 30 mg/l $CBOD_5$ and TSS (monthly average) • 45 mg/l $CBOD_5$ and TSS (weekly average) • 60 mg/l $CBOD_5$ and TSS (single sample) • 10 mg/l TSS for subsurface application systems (single sample) • Chlorine residual of 0.5 mg/l maintained after at least 15 minutes contact time at peak flow • Fecal coliform - 200/100 ml (annual	• Parameters to be monitored and sampling frequency to be identified in wastewater facility permit • Minimum schedule for sampling and testing based on system capacity established for flow, pH, chlorine residual, dissolved oxygen, suspended solids, $CBOD_5$, nutrients, and fecal coliform • Primary and secondary drinking water standards to be monitored by facilities $\geq$ 100,000 gpd		• At a minimum, system storage capacity shall be the volume equal to 3 times the portion of the average daily flow for which no alternative reuse or disposal system is permitted • Water balance required with volume of storage based on a 10-year recurrence interval and a minimum of 20 years of climatic data • Not required if alternative system is incorporated into the system design to ensure continuous facility operation	• Site specific • Design hydraulic loading rate - maximum annual average of 2 in/wk is recommended • Based on nutrient and water balance assessments	• Required • One upgradient well located as close as possible to the site without being affected by the site's discharge (background well) • One well at the edge of the zone of discharge downgradient of the site (compliance well) • One well downgradient from the site and within the zone of discharge (intermediate well) • Other wells may be required depending on site-specific criteria • Quarterly monitoring	• 100 feet to buildings not part of the treatment facility, utility system, or municipal operation • 100 feet to site property lines • 500 feet to potable water supply wells and Class I and Class II surface waters • 100 feet from reclaimed water transmission facility to public water supply wells • 100 feet to outdoor public eating, drinking, and bathing facilities • 500 feet from new unlined storage ponds to potable water supply wells • Some setback	• Public access will be restricted unless a subsurface application system is used • Reclaimed water may be applied to pastures, wholesale nurseries, sod farms, forests, and areas used to grow feed, fodder, fiber, or seed crops • Milking cows are not permitted to graze on land for a period of 15 days after last application of reclaimed water

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	average) - 200/100 ml (monthly geometric mean) - 400/100 ml (not to exceed in more than 10 percent of samples in a 30-day period) - 800/100 ml (single sample) • pH 6 - 8.5 • Limitations to be met after disinfection					required for water level, nitrate, total dissolved solids, arsenic, cadmium, chloride, chromium, lead, fecal coliform, pH, and sulfate • Monitoring may be required for additional parameters based on site-specific conditions and groundwater quality	distances can be reduced if additional disinfection and reliability are provided or if alternative application techniques are used	
Georgia	• Secondary treatment followed by coagulation, filtration, and disinfection • 5 mg/l BOD • 5 mg/l TSS • Fecal coliform - 23/100 ml (monthly average) - 100/100 ml (maximum any sample) • pH 6 - 9 • Turbidity not to exceed 3 NTU prior to disinfection	• Continuous turbidity monitoring prior to disinfection • Weekly sampling for TSS and BOD • Daily monitoring for fecal coliform • Daily monitoring for pH • Detectable disinfection residual monitoring	• Multiple process units • Ability to isolate and bypass all process units • System must be capable of treating peak flows with the largest unit out of service • Equalization may be required • Back-up power supply • Alarms to warn of loss of power supply,	• Reject water storage equal to at least 3 days of flow at the average daily design flow • One of the following options must be in place to account for wet weather periods - sufficient storage onsite or at the customer's location to handle the			• Determined on a case-by-case basis	

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	• Detectable disinfectant residual at the delivery point		failure of pumping systems, failure of disinfection systems, or turbidity greater than 3 NTU	flows until irrigation can be resumed - additional land set aside that can be irrigated without causing harm to the cover crop - An NPDES permit for all or part of the flow				
Hawaii	*R-1 water:* • Oxidized, filtered, and disinfected • Fecal coliform - 2.2/100 ml (7-day median) - 23/100 ml (not to exceed in more than one sample in any 30-day period) - 200/100 ml (maximum any one sample) • Inactivation and/or removal of 99.999 percent of the plaque-forming units of F-specific bacteriophage MS2, or polio virus • Detectable	• Daily flow monitoring • Continuous turbidity monitoring prior to and after filtration process • Continuous measuring and recording of chlorine residual • Daily monitoring of fecal coliform • Weekly monitoring of BOD_5 and suspended solids	• Multiple or standby units required with sufficient capacity to enable effective operation with any one unit out of service • Alarm devices required for loss of power, high water levels, failure of pumps or blowers, high head loss on filters, high effluent turbidity, loss of coagulant or polymer feed, and loss of chlorine residual • Standby power	• 20 days storage required unless it can be demonstrated that another time period is adequate or that no storage is necessary • Storage requirements based on water balance using at least a 30-year record • Reject storage required with a volume equal to 1 day of flow at the average daily design flow • Emergency system storage not required	• Design application rate determined by water balance	• Required • Groundwater monitoring system may consist of a number of lysimeters and/or monitoring wells depending on site size, site characteristics, location, method of discharge, and other appropriate considerations • One well upgradient and two wells downgradient for project sites 500 acres or more • One well within	*R-1 water:* • Minimum of 50 feet to drinking water supply well • Outer edge of impoundment at least 100 feet from any drinking water supply well *R-2 water:* • For spray irrigation applications, 500 feet to residence property or a place where public exposure could be similar to that at a park, elementary school yard or athletic field • Minimum of	• R-1 water can be used for spray irrigation of pastures for milking and other animals • R-2 water can be used with buffer for spray irrigation of sod farms, feed, fodder, fiber, and seed crops not eaten by humans, and timber and trees not bearing food crops • R-2 water can be used for subsurface irrigation of pastures for milking and other animals

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	turbidity not to exceed 5 NTU for more than 15 minutes and never to exceed 10 NTU prior to filtration • Effluent turbidity not to exceed 2 NTU • Chemical pretreatment facilities required in all cases where granular media filtration is used; not required for facilities using membrane filtration • Theoretical chlorine contact time of 120 minutes and actual modal contact time of 90 minutes throughout which the chlorine residual is 5 mg/l *R-2 water:* • Oxidized and disinfected • Fecal coliform - 23/100 ml		source required for treatment plant and distribution pump stations	where an alternate effluent disposal system has been approved		the wetted field area for each project whose surface area is greater than or equal to 1,500 acres • One lysimeter per 200 acres • One lysimeter for project sites that have greater than 40 but less than 200 acres • Additional lysimeters may be necessary to address public health concerns or environmental protection as related to variable characteristics of the subsurface or of the operations of the project	100 feet to any drinking water supply well • Outer edge of impoundment at least 300 feet from any drinking water supply well *R-3 water:* • Minimum of 150 feet to drinking water supply well • Outer edge of impoundment at least 1000 feet to any drinking water supply well	• R-2 water can be used for surface, drip, or subsurface irrigation of ornamental plants for commercial use only if plants are harvested above any portion contacted by reclaimed water • R-3 water can be used for drip, surface, or subsurface irrigation of feed, fodder, and fiber crops not eaten by humans and timber and trees not bearing food crops (irrigation must cease at least 24 days before harvest) • R-3 water can be used for drip or surface irrigation of seed crops not eaten by humans • R-2 water

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	(7-day median) - 200/100 ml (not to exceed in more than one sample in any 30-day period) • Theoretical chlorine contact time of 15 minutes and actual modal contact time of 10 minutes throughout which the chlorine residual is 0.5 mg/l *R-3 water:* • Oxidized wastewater							used in spray irrigation will be performed when the area is closed to the public and the public is absent from the area, and will end at least 1 hour before the area is open to the public • Subsurface irrigation may be performed at any time
Idaho	*Unrestricted public access:* • Disinfected primary effluent • Total coliform - 230/100 ml (7-day median) *Restricted public access:* • Primary effluent							• Animals not to be grazed on land where effluent is applied • Animals not to be fed vegetation irrigated with effluent until at least two weeks after application
Illinois	• Two-cell lagoon or mechanical secondary			• Minimum storage capacity equal to at least 150	• Based on the limiting characteristic of the treated	• Required • One well upgradient for determining	• 200 feet to residential lot lines • 25 feet to any	

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	treatment			days of wastewater at design average flow except in southern Illinois areas where a minimum 120 days of storage capacity to be provided • Storage can be determined based on a rational design that must include capacity for the wettest year with a 20-year return frequency	wastewater and the site • Balances must be calculated and submitted for water, nitrogen, phosphorus, and BOD	background concentrations • Two wells downgradient in the dominant direction of groundwater movement • Wells between each potable water well and the application area if within 1,000 feet • Monitoring of nitrates, ammonia nitrogen, chlorides, sulfates, pH, total dissolved solids, phosphate, and coliform bacteria	residential lot line if surrounded by a fence with a minimum height of 40 inches • No buffer required if the application and its associated drying time occur during a period when the area is closed to the public	
Indiana	• Secondary treatment and disinfection • 30 mg/l BOD_5 • 30 mg/l TSS • Fecal coliform - 200/100 ml (7-day median) - 800/100 ml (single sample) • pH 6 - 9 • Total chlorine residual at least 1 mg/l after a	• Daily monitoring of TSS, coliform and chlorine residual • Weekly monitoring of BOD and pH • Monthly monitoring of total nitrogen, ammonium nitrogen, nitrate nitrogen,	• Alternate power source required	• Minimum of 90 days effective storage capacity required	• Maximum hydraulic loading rate of 2 in/week		• 200 feet to potable water supply wells or drinking water springs • 300 feet to any waters of the state • 300 feet to any residence	• No restrictions are placed on fecal coliform organisms where public access is strictly restricted • Feed and fiber crops not to be harvested for 30 days after land application of wastewater

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	minimum contact time of 30 minutes (if chlorination is used for disinfection)	phosphorus, and potassium • Annual monitoring of arsenic, cadmium, copper, lead, mercury, nickel, selenium, and zinc						• Turfgrass not to be harvested for 1 year after application of wastewater • Grazing of animals prohibited for 30 days after land application of wastewater
Iowa	• At a minimum, treatment equivalent to that obtained from a primary lagoon cell • Disinfection - required for all land application systems with spray irrigation application technique - must precede actual spraying of the wastewater on to a field area and must not precede storage - minimum contact time of 15 minutes with equipment necessary to maintain a	• Monitoring of the following parameters required unless it has been demonstrated that they are present in insignificant amounts in the influent wastewater: total organic carbon, total dissolved solids, sodium absorption ratio, electrical conductivity, total nitrogen, ammonia nitrogen, organic nitrogen, nitrate nitrogen, total phosphorus,	• Minimum of two storage cells required capable of series and parallel operation	• Minimum days of storage based on climatic restraints • When flows are generated only during the application period, a storage capacity of 45 days or the flow generated during the period of operation (whichever is less) must be provided • When discharging to a receiving waterway on a periodic basis, storage for 180 days of average wet	• Determined by using a water balance per month of operation • For overland flow systems, maximum hydraulic application rate of 3 in/week	• Monitoring required adjacent to the site both up and downstream of the site in reference to the general groundwater flow direction	• 300 feet to existing dwellings or public use areas (not including roads and highways) • 400 feet to any existing potable water supply well not located on property • 300 feet to any structure, continuous flowing stream or other physiographic feature that may provide direct connection between the groundwater table and the surface • Wetted	• Categorized as land application using slow rate (irrigation) and overland flow

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	residual chlorine level of 0.5 mg/l	chloride, pH, alkalinity, hardness, trace elements, and coliform bacteria • Location of monitoring in effluent prior to site application • Reporting frequency depends on size of system		weather flow is required			disposal area to be at least 50 feet inside the property line of the land application site *Additional requirements for Slow Rate System:* • 1,000 feet to any shallow public water supply well • 500 feet to any public lake or impoundment • _ mile to any public lake or impoundment used as a source of raw water by a potable water supply	
Kansas	• Secondary treatment with periodic discharge to surface waters • Primary treatment with no discharge to surface water			• Storage provided to retain a minimum of 90-days average dry weather flow when no discharge to surface water is available	• Maximum daily application rate of 3 in/ac/day • Maximum annual application rate of 40 in/acre • Based on soil and crop moisture and/or nutrient requirements of selected crop	• Site specific	• 500 feet to residential areas • 200 feet to wells and water supplies off of site property • 100 feet to adjacent properties • Groundwater table a depth of at least 10 feet beneath application	

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
							area	
Maryland	• 70 mg/l BOD • 90 mg/l TSS • pH 6.5 - 8.5 • Fecal coliform - 200/100 ml			• Minimum of 60-days storage to be provided for all systems receiving wastewater flows throughout the year	• Maximum application rate of 2 in/wk on annual average basis • Water balance required based on wettest year in the last 10 years of record • Actual application rate accepted must consider permeability of the soils, depth to groundwater, and the nutrient balance of the site	• May be required • One well upgradient of site • Two wells adjacent to the property line and downgradient of site • Monitoring frequency determined on a case-by-case basis	• 200 feet to property lines, waterways, and roads for spray irrigation • 500 feet to housing developments and parks for spray irrigation • Reduction of the buffer zone up to 50 percent will be considered with adequate windbreak • Minimum buffer zone of 50 feet for all other types of slow rate systems	• Categorized as land treatment
Massachusetts	• Secondary treatment with filtration and disinfection • pH 6 - 9 • 10 mg/l BOD_5 • Turbidity - 2 NTU (average over 24-our period) - 5 NTU (not to exceed at any time) • Fecal coliform - no detectable colonies	• pH - daily • BOD - weekly • Turbidity - continuous monitoring prior to disinfection • Fecal coliform - daily • Disinfection UV intensity - daily or chlorine residual - daily • TSS - twice per week	• EPA Class I Reliability standards may be required • Two independent and separate sources of power • Unit redundancy • Additional storage	• Immediate, permitted discharge alternatives are required for emergency situations and for non-growing season disposal		• Required • Monitoring wells to be located and constructed to strategically sample the geologic units of interest between the discharges and sensitive receptors and withdrawal points • Sensitive	• 100 feet to buildings, residential property, private wells, Class A surface water bodies, and surface water intakes • Other than for private wells, using a green barrier in the form of hedges or trees placed	• Includes use of reclaimed water for landscaping at nurseries • Spray irrigation must take place during non-use hours and cannot result in any ponding

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	(7-day median) - 14/100 ml (single sample) • 5 mg/l TSS • 10 mg/l total nitrogen • Class I groundwater permit standards (SDWA Drinking Water Standards)	• Nitrogen - twice per month • Phosphorus - twice per month • Heterotrophic plate count - quarterly • MS-2 phage - quarterly Permit standards -variable testing requirements				receptors include, but are not limited to public and private wells, surface waters, embayments, and ACECs • Monitoring and testing frequency and parameters determined based on land use, effluent quality and quantity, and the sensitivity of receptors	at the dwelling side of the buffer may reduce the setback distance to 50 feet • No spray irrigation directed into Zone I of public water supply wells	
Michigan	• pH 5.5 - 10 • 20 mg/l total inorganic nitrogen • 0.5 mg/l nitrite • 5 mg/l phosphorus • 1 mg/l phosphorus if surface water body is downgradient within 1,000 feet • Aluminum, 150 ug/l • Chloride, 250 mg/l • Sodium, 150 mg/l • Sulfate, 250 mg/l	• Flow measurement • Grab samples collected and analyzed twice each month for ammonia-nitrogen, nitrate-nitrogen, nitrite-nitrogen, sodium, chloride, phosphorus, and pH			• Daily, monthly, or annual design hydraulic loading rate shall not be more than 7 percent of the permeability of the most restrictive soil layer within the solum as determined by the saturated hydraulic conductivity method or 12 percent of the permeability as determined by the basin	• May be required • Monitoring requirements specific to each site	• 100 feet to property lines	• Dairy animals shall not be allowed to graze on fields until 30 days after the application • Allows irrigation of vegetated areas between May 1 and October 15 • Governed by Michigan Department of Environmental Quality issued groundwater discharge permits • Categorized as

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	• Iron, 300 ug/l • Manganese, 50 ug/l • THM limits • Treatment technology standards for certain organic substances • Additional effluent criteria determined on a case-by-case basis				infiltration method • Annual hydraulic loading rate shall not be more than 3 percent of the permeability of the solum when determined by either the cylinder infiltration method or air entry permeameter test method			slow rate land treatment
Missouri	• Treatment equivalent to that obtained from primary wastewater pond cell			• Minimum of 45 days in south with no discharge • Minimum of 90 days in north with no discharge • Based on the design wastewater flows and net rainfall minus evaporation expected for a one in 1--year return frequency for the storage period selected	• Application rates shall in no case exceed - 0.5 in/hour - 1.0 in/day - 3.0 in/week • Maximum annual application rate not to exceed a range from 4 to10 percent of the design sustained permeability rate for the number of days per year when soils are not frozen • Nitrogen	• Minimum of one well between site and public supply well	• 150 feet to existing dwellings or public use areas, excluding roads or highways • 50 feet to property lines • 300 feet to potable water supply wells not on property, sinkholes, and losing streams or other structure or physiographic feature that may provide	• From May 1 to October 30, grazing of animals or harvesting of forage shall be deferred for 14 days after irrigation • From November 1 to April 30, grazing of animals or harvesting of forage shall be deferred for 30 days after irrigation • Grazing of dairy animals generally not

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
					loading not to exceed the amount of nitrogen that can be used by the vegetation to be grown		direct connection between the groundwater table and the surface	recommended unless there has been a much longer deferment period
Montana	*Fodder, fiber, and seed crops:* • Oxidized wastewater • Disinfection generally not required *Pasture for milking animals:* • Oxidized and disinfected • Fecal coliform - 23/100 ml (7-day median)	• Effluent to be monitored on a regular basis to show the biochemical and bacteriological quality of the applied wastewater • Monitoring frequency to be determined on a case-by-case basis			• Nitrogen and hydraulic loadings determined based on methods in EPA Manual 625/1-81-013 • Hydraulic loading must be based on the wettest year in ten years	• Determined on a case-by-case basis • Consideration is given to groundwater characteristics, past practices, depth to groundwater, cropping practices, etc.	• 100 feet to any water supply well • Distance to surface water determined on a case-by-case basis based on quality of effluent and the level of disinfection *Additional requirements for fodder, fiber, and seed crops:* • Fencing must be provided • 200 feet between fencing and irrigated area • 200 feet to any dwelling, including residential property	
Nebraska	• Biological treatment	• Site specific			• Hydraulic loading rate should not exceed 4 in/wk • Nitrogen loading not to	• Site specific		

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances (1)	Other
					exceed crop uptake			
Nevada	• Secondary treatment with disinfection • 30 mg/l BOD_5 • Disinfection *Spray irrigation: Minimum buffer zone of 400 feet* • Fecal coliform - 200/100 ml (30-day geometric mean) - 400/100 ml (maximum daily number) *Minimum buffer zone of 800 feet* • Fecal coliform - no limit *Surface irrigation:* • Fecal coliform - 200/100 ml (30-day geometric mean) - 400/100 ml (maximum daily number)						*Spray irrigation:* • 400 foot or 800 foot minimum buffer required depending on disinfection level *Surface irrigation*: • None required	• Includes irrigation of land used for pasture or other agricultural purposes except growing crops for human consumption • Public access to site is prohibited
New Jersey	• Fecal coliform - 200/100 ml (monthly average, geometric mean) - 400/100 ml (maximum any one sample)	• Submission of Standard Operations Procedure that ensures proper disinfection to the required level of 1.0 mg/l		• Not required when another permitted reuse system or effluent disposal system is incorporated into the system	• Hydraulic loading rate - maximum annual average of 2 in/wk but may be increased based on a		• 500 feet to potable water supply wells that are existing or have been approved for construction • 100 feet	• Secondary treatment, for the purpose of the manual, refers to the existing treatment requirements in the NJPDES

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	• Minimum chlorine residual -1.0 mg/l after 15-minute contact at peak hourly flow • Alternative methods of disinfection, such as UV and ozone, may be approved • TSS - existing treatment requirements as specified in the NJPDES permit for the discharge • Total nitrogen - 10 mg/l but may be less stringent if higher limit is still protective of environment • Secondary	• Chlorination levels should be continually evaluated to ensure the reclaimed water will not adversely impact vegetation • Annual usage report		design • If system storage ponds are used, they do not have to be lined • Reject storage ponds shall be lined or sealed to prevent measurable seepage • Existing or proposed ponds (such as golf course ponds) are appropriate for storage of reuse water if the ability of the ponds to function as stormwater management systems is not impaired	site-specific evaluation • The distribution of reclaimed water shall not produce surface runoff or ponding • Land application sites shall not be frozen or saturated when applying reclaimed water		provided from a reclaimed water transmission facility to all potable water supply wells • 500 feet from FW1 surface waters, Pineland Waters and Shellfish Waters • All other surface water setback distances shall be established on a case-by-case basis • 100 feet from outdoor public eating, drinking, and bathing facilities	permit, not including the additional reclaimed water for beneficial reuse treatment requirements • A chlorine residual of 0.5 mg/l or greater is recommended to reduce odors, slime and bacterial re-growth • For a period of 15 days from the last application of reclaimed water, land application areas shall not be used for the grazing of cattle whose milk is intended for human consumption
New Mexico	*Fodder, fiber, and seed crops:* • Primary effluent *Pastures for milking cows* • Adequately	• Fecal coliform sample taken at point of diversion to irrigation system						

(1) Distances are from edge of wetted perimeter unless otherwise noted.

Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	disinfected • Fecal coliform - 100/100 ml							
New York	• Secondary treatment and disinfection	• Flow measurement and wastewater characteristics		• Two weeks plus any flow generated in prohibited time period (includes rainfall events)	• Hydraulic - 3 in/wk • Organic - 600 lbs of BOD/acre/day • Maximum salinity - 1,000 mg/l	• Required • Minimum of three off-field wells	• 200 feet to surface waters, dwellings and public roadways	• Spray irrigation should be practiced only from May 1 to November 30 and only during daylight hours • Categorized as land treatment
North Dakota	• If waste stabilization ponds are used - minimum 180 days capacity without consideration for evaporation • Representative sample of reclaimed water must be submitted to determine suitability for irrigation				• Site specific • Based on soils type and type of vegetation • Application rates generally between 0.5 to 4 in/wk			• Areas readily accessible to humans or animals, such as pastures being grazed by dairy animals, hay crops ready for harvesting, or garden crops for human consumption, should not be irrigated
Ohio	• Biological treatment • Disinfection should be considered • 40 mg/l $CBOD_5$ • Fecal coliform (30-day average)	*Large system monitoring (150,000 to 500,000 gpd):* • Twice weekly for $CBOD_5$, total coliform (when irrigating) and storage		• Operational storage of 4 times the daily design flow needed • Storage provisions for at least 130 days of design average flow	• Determined by calculating a water and nutrient balance	• Monitoring wells upgradient and downgradient of large irrigation systems • Monitoring wells should be sampled at	• 100 feet to private water well • 300 feet to community water well • 100 feet to sink hole • 50 feet to drainage way	• Includes agricultural sites where nonhuman food crops are grown

(1) Distances are from edge of wetted perimeter unless otherwise noted.

Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	- 23/100 ml with no public access buffer - 1,000/100 ml with 100 foot public access buffer - No disinfection necessary with 200 foot or more public access buffer • Limits for metals	volume • Monthly monitoring for total inorganic nitrogen • Daily monitoring for flow *Small system monitoring: (<150,000 gpd)* • Weekly monitoring of $CBOD_5$ and storage volume • Monthly monitoring of total coliform • Daily monitoring of flow		needed for periods when irrigation is not recommended • Actual storage requirements determined by performing water balance • Permits can be obtained for stream discharge during winter and times of high stream flow to reduce storage needs		the beginning and the end of the irrigation season	• 50 feet to surface water • 100 feet to road right-of-way without windbreak using spray irrigation • 10 feet to road right-of-way with windbreak or with flood irrigation • 50 feet to property line	
Oklahoma	• Primary treatment		• Standby power required for continuity of operation during power failures	• Required for periods when available wastewater exceeds design hydraulic loading rate, and when the ground is saturated or frozen • Based on water balance • Must provide at least 90	• Based on the lower of the two rates calculated for soil permeability and nitrogen requirements		• 100 feet to adjacent property • Additional distance may be required where prevailing winds could cause aerosols to drift into residential areas • Buffer zone to be a part of the permitted site	

(1) Distances are from edge of wetted perimeter unless otherwise noted.

Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
				days of storage above that required for primary treatment				
Oregon	*Pasture for animals, sod, ornamental nursery stock, christmas trees, and firewood* • Level II - biological treatment and disinfection • Total coliform - 240/100 ml (2 consecutive samples) - 23/100 ml (7 day median) *Fodder, fiber, and seed crops not for human ingestion and commercial timber* • Level I - biological treatment	*Pasture for animals, sod, ornamental nursery stock, christmas trees, and firewood* • Total coliform sampling - 1 time per week *Fodder, fiber, and seed crops not for human ingestion and commercial timber* • None required	• Standby power with capacity to fully operate all essential treatment processes • Redundant treatment facilities and monitoring equipment to meet required levels of treatment • Alarm devices to provide warning of loss of power and/or failure of process equipment				*Pasture for animals, sod, ornamental nursery stock, christmas trees, and firewood* • 10-foot buffer with surface irrigation • 70-foot buffer with spray irrigation *Fodder, fiber, and seed crops not for human ingestion and commercial timber* • 10 foot buffer with surface irrigation • Site specific requirements with spray irrigation	*Pasture for animals, sod, ornamental nursery stock, christmas trees, and firewood* • No animals on pasture during irrigation • No irrigation 3 days prior to harvesting *Fodder, fiber, and seed crops not for human ingestion and commercial timber* • No irrigation for 30 days prior to harvesting • Spray irrigation may be permitted if it can be demonstrated that public health and the environment will be adequately protected from aerosols
Pennsylvania	• Secondary			• Storage	• Hydraulic	• A minimum of		• Categorized as

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	treatment and disinfection • Minimum of 85 percent removal of $CBOD_5$ and TSS • Concentration levels based on a 30-day average - 25 mg/l CBOD5 - 30 mg/l TSS • Fecal coliform - 200/100 ml (monthly geometric average) • pH 6 - 9			requirements determined using daily, weekly, or monthly water balance calculations • Seasonal discharge to surface waters may be an alternative to storage	loading rates based on a water balance that includes precipitation, infiltration rate, evapotrans-piration, soil storage capabilities, and subsoil permeability • Application rates both site and waste specific • Application rates greater than 2 in/ac/wk generally not considered	two wells must be located downgradient of the application area		land application of treated sewage • Pertains to slow rate infiltration systems
South Carolina	• Secondary treatment and disinfection • BOD_5 and TSS - 30 mg/l (monthly average) - 45 mg/l (weekly average) • Total coliform - 200/100 ml (monthly average) - 400/100 ml (daily maximum)	• Nitrate monitoring required			• Hydraulic - maximum of 0.5-2 in/wk depending on depth to groundwater • A nitrate to nitrogen loading balance may be required • Application rates in excess of 2 in/wk may be approved provided the application is only for a portion of the	• Required • One well upgradient • Two wells downgradient • At larger sites, more monitoring wells may be required	• 200 feet to surface waters of the state, occupied buildings, and potable water wells • 100 feet to property boundary	

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances (1)	Other
					year; requires a water balance for the summer season			
South Dakota	• Secondary treatment			• Minimum of 210 days capacity without consideration for evaporation	• Maximum application rate limited to 2 in/acre/wk or a total of 24 in/acre/yr	• Shallow wells in all directions of major groundwater flow from site and no more than 200 feet outside of the site perimeter, spaced no more than 500 feet apart, and extending into the groundwater table • Shallow wells within the site are also recommended	• 1 mile from municipal water supply • _ mile from private domestic water supply, lakes, and human habitation • _ mile from state parks and recreation areas unless disinfected • 100 feet from neighboring property lines or road right of ways	• Does not include pastures used for dairy grazing
Tennessee	• Biological treatment • Treated to a level afforded by lagoons • Disinfection generally not required, however can be required when deemed necessary	• Site specific		• Storage requirements determined by either of two methods 1) use of water balance calculations or, 2) use of a computer program that was developed based upon an extensive	• Nitrogen - percolate nitrate-nitrogen not to exceed 10 mg/l • Hydraulic - based on water balance using 5-year return monthly precipitation	• Required	*Surface Irrigation:* • 100 feet to site boundary • 50 feet to onsite streams, ponds, and roads *Spray Irrigation:* [1] Open Fields • 300 feet to site boundary • 150 feet to onsite streams, ponds, and	

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
				NOAA study of climatic variations throughout the United States			roads [2] Forested • 150 feet to site boundary • 75 feet to onsite streams, ponds, and roads	
Texas	*Type I reclaimed water:* • 5 mg/l BOD_5 or $CBOD_5$ (30-day average) • 10 mg/l for landscape impoundment (30-day average) • Turbidity - 3 NTU • Fecal coliform - 20/100 ml (geometric mean) - 75/100 ml (not to exceed in any sample) *Type II reclaimed water:* • 30 mg/l BOD_5 with treatment using pond system (30-day average) • 20 mg/l BOD_5 or 15 mg/l $CBOD_5$ with treatment other than pond system (30-day average)	*Type I reclaimed water:* • Sampling and analysis twice per week for BOD_5 or $CBOD_5$, turbidity, and fecal coliform *Type II reclaimed water:* • Sampling and analysis once per week for BOD_5 or $CBOD_5$ and fecal coliform			• Based on water balance			• Type I reclaimed water can be used for irrigation of pastures for milking animals • Type II reclaimed water can be used for irrigation of sod farms, silviculture, and animal feed crops

(1) Distances are from edge of wetted perimeter unless otherwise noted.

Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	• Fecal coliform - 200/100 ml (geometric mean) - 800/100 ml (not to exceed in any sample)							
Utah	*Type I treated wastewater:* • Secondary treatment with filtration and disinfection • 10 mg/l BOD (monthly average) • Turbidity prior to disinfection - not to exceed 2 NTU (daily average) - not to exceed 5 NTU at any time • Fecal coliform - none detected (weekly median as determined from daily grab samples) - 14/100 ml (not to exceed in any sample) • 1.0 mg/l total residual chlorine after 30 minutes contact time at peak flow	*Type I treated wastewater:* • Daily composite sampling required for BOD • Continuous turbidity monitoring prior to disinfection • Daily monitoring of fecal coliform • Continuous total residual chlorine monitoring • pH monitored continuously or by daily grab samples *Type II treated wastewater:* • Weekly composite sampling required for BOD • Daily composite sampling required for	• Alternative disposal option or diversion to storage required in case quality requirements not met				*Type I treated wastewater:* • 50 feet to any potable water well • Impoundments at least 500 feet from any potable water well *Type II treated wastewater:* • 300 feet to any potable water well • 300 feet to areas intended for public access • Impoundments at least 500 feet from any potable water well • Public access to effluent storage and irrigation or disposal sites to be restricted by a stocktight fence or other comparable means	• Type I reclaimed water can be used for irrigation of pastures for milking animals • Type II reclaimed water can be used for irrigation of sod farms, silviculture, and animal feed crops

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	• pH 6 - 9 *Type II treated wastewater:* • Secondary treatment with disinfection • 25 mg/l BOD (monthly average) • TSS - 25 mg/l (monthly average) - 35 mg/l (weekly mean) • Fecal coliform - 200/100 ml (weekly median) – 800/100 ml (not to exceed in any sample) • pH 6 - 9	TSS • Daily monitoring of fecal coliform • pH monitored continuously or by daily grab samples						
Vermont	• Minimum of secondary treatment • Tertiary treatment with nitrogen and phosphorus removal can be provided instead of secondary treatment • BOD ≤30 mg/l at any time • TSS ≤30 mg/l at any time • Disinfection with 20 minute		• Multiple units required • Alternative power source required • Retention pond or tank required with volume sufficient to hold the design flow for 48 hours	• Storage sized so that the system can operate effectively without having to spray during the spring runoff months • Minimum storage capacity required - 45 days of design flow	• 2 in/wk for systems with secondary treated effluent • 2.5 in/wk for systems with tertiary treatment with nitrogen and phosphorus removal • Maximum hourly application rate of 0.25 in/hour based on actual wetted area		• 100 feet to edge of any surface water • 200 feet to, habitation, property lines, roads, or areas frequented by the public • 200 feet to any water supply	• Categorized as spray disposal system

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	chlorine contact time immediately prior to spraying • 1.0 ppm free chlorine residual or 4.0 ppm total chlorine residual at the spray nozzle							
Washington	*Class D:* • Oxidized and disinfected • Total coliform - 240/100 ml (7 day mean) *Class C:* • Oxidized and disinfected • Total coliform - 23/100 ml (7-day mean) - 240/100 ml (single sample) *General compliance requirements:* • 30 mg/l BOD and TSS (monthly mean) • Turbidity - 2 NTU (monthly) - 5 NTU (not to exceed at any time) • Minimum chlorine	• BOD – 24-hour composite samples collected at least weekly • TSS – 24-hour composite samples collected at least daily • Total coliform and dissolved oxygen - grab samples collected at least daily • Continuous on-line monitoring of turbidity	• Warning alarms independent of normal power supply • Back-up power source • Emergency storage: short-term, 1 day; long-term, 20 days • Multiple treatment units or storage or disposal options • Qualified personnel available or on call at all times the irrigation system is operating	• Storage required when no approved alternative disposal system exists • Storage volume established by determining storage period required for duration of a 10-year storm, using a minimum of 20 years of climatic data • At a minimum, system storage capacity should be the volume equal to 3 times that portion of the average daily flow for which no alternative reuse or	• Hydraulic loading rate to be determined based on a detailed water balance analysis	• May be required • Monitoring program will be based on reclaimed water quality and quantity, site specific soil and hydrogeologic characteristics, and other considerations	*Class D:* • 100 feet to areas accessible to the public and the use area property line • 300 feet to any potable water supply *Class C:* • 50 feet to areas accessible to the public and use area property line • 100 feet to any potable water supply well	• Class D reclaimed water can be used for irrigation of trees or fodder, fiber, and seed crops • Class C reclaimed water can be used for irrigation of sod, ornamental plants for commercial use, or pasture to which milking cows or goats have access

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	residual of 1 mg/l after a contact time of 30 minutes			disposal system is permitted				
West Virginia	• Secondary treatment and disinfection • 30 mg/l BOD_5 • 30 mg/l TSS	• Frequency of reporting determined on a case-by-case basis		• Minimum of 90 days storage to be provided	• Hydraulic - maximum application rates of 0.25 in/hr 0.50 in/day 2.0 in/wk	• Minimum of one well between project site and public well(s) or high capacity private wells • Minimum of one well in each direction of groundwater movement	• Fence to be placed at least 50 feet beyond spray area • 350 feet from fence to adjacent property lines or highways unless low trajectory spray and/or physical buffers are provided	• Analysis of crop required at harvest if used for animal consumption
Wisconsin	• Biological, chemical, physical or a combination of treatments necessary to meet effluent standards • Monthly average BOD_5 may not exceed 50 mg/l • Fecal coliform bacteria limits based on potential impact to public health • Nitrogen limits based on needs of cover	• Total daily flow monitored • Monthly monitoring for total dissolved solids, chlorides, BOD_5, organic nitrogen, ammonia nitrogen and nitrate plus nitrite nitrogen • Fecal coliform bacteria monitoring may be required on a case-by-case basis • Soil at each		• Storage lagoons required for systems adversely affected by winter conditions or wet weather	• Determined on a case-by-case basis • Based on hydrogeologic conditions, soil texture, permeability, cation exchange capacity, topography, cover crop, and wastewater characteristics • Average hydraulic application rate may not exceed 10,000	• Required for design flows greater than 0.015 mgd • Monitoring may be required for elevation, BOD_5, field specific conductance, COD, organic nitrogen, ammonia nitrogen, nitrate plus nitrite nitrogen, chlorides, sulfates, total dissolved solids,	• 250 feet to private water supply wells • 1,000 feet to public water supply wells	• Categorized as land disposal

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Table A-4. Agricultural Reuse – Non-Food Crops

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	crop plus demonstrable denitrification	individual spray field tested annually for nitrogen, available phosphorus, available potassium, and pH			gal/acre/day	alkalinity, hardness, temperature, and pH		
Wyoming	• Minimum of Class C wastewater-primary treatment and disinfection • Fecal coliform - 200/100 ml or greater but less than 1000/100 ml	• Treated wastewater to be analyzed for fecal coliform, nitrate as N, ammonia as N, and pH at a minimum • Monitoring frequency - once per month for lagoon systems - once per week for mechanical systems • Frequency specified in NPDES permit required if more frequent	• Multiple units and equipment • Alternative power sources • Alarm systems and instrumenta-tion • Operator certification and standby capability • Bypass and dewatering capability • Emergency storage	• Emergency storage	• Will be applied for the purpose of beneficial reuse and will not exceed the irrigation demand of the vegetation at the site • Not to be applied at a rate greater than the agronomic rate for the vegetation at the site • Will be applied in a manner and time that will not cause any surface runoff or contamination of a groundwater aquifer		• 30 feet to adjacent property lines • 30 feet to all surface waters • 100 feet to all potable water supply wells • 100-foot buffer zone around spray site *Spray Irrigation:* • 100 feet to adjacent property lines and any public right-of-way *Flood Irrigation:* • 30 feet to adjacent property lines and any public right-of-way	• Pertains to irrigation on agricultural lands supporting indirect food chain crops • Animals not allowed to graze on land for 30 days after reclaimed water application

(1) Distances are from edge of wetted perimeter unless otherwise noted.

Table A-5. Unrestricted Recreational Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
California	• Disinfected tertiary recycled water that has been subjected to conventional treatment (see monitoring requirements if recycled water has not received conventional treatment) - oxidized, coagulated (not required if membrane filtration is used and/or turbidity requirements are met), clarified, filtered, disinfected • Total coliform measured at a point between the disinfection process and the point of entry to the use impoundment - 2.2/100 ml (7 day median) - 23/100 ml (not to exceed in more than	• Total coliform - sampled at least once daily from the disinfected effluent • Turbidity - continuously sampled following filtration *Monitoring requirements if recycled water has not received conventional treatment:* • Sampled and analyzed monthly for *Giardia*, enteric viruses, and *Cryptosporidium* for first 12 months and quarterly thereafter • Samples to be taken at a point following disinfection and prior to the point where recycled water enters the use impoundment • Ongoing monitoring may be discontinued	• Warning alarms • Back-up power source • Multiple treatment units capable of treating entire flow with one unit not in operation or storage or disposal provisions • Emergency storage or disposal: short-term, 1 day; long-term, 20 days • Sufficient number of qualified personnel				• No impoundment of disinfected tertiary recycled water within 100 feet of any domestic water supply well	

Table A-5. Unrestricted Recreational Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	one sample in any 30-day period) - 240/100 ml (maximum any one sample) • Turbidity requirements for wastewater that has been coagulated and passed through natural undisturbed soils or a bed of filter media - maximum average of 2 NTU within a 24-hour period - not to exceed 5 NTU more than 5 percent of the time within a 24-hour period - maximum of 10 NTU at any time • Turbidity requirements for wastewater passed through membrane - not to exceed 0.2 NTU more than 5 percent of the time within a	after the first 2 years of operation with approval						

Table A-5. Unrestricted Recreational Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	24-hour period - maximum of 0.5 NTU at any time							
Colorado	• Oxidized, coagulated, clarified, filtered, and disinfected • Total coliform - 2.2/100 ml (7-day median) - 23/100 ml (not to exceed in more than one sample in any 30-day period)						• 500 feet from impoundment to domestic supply well • 100 feet from impoundment to any irrigation well	
Nevada	• At a minimum, secondary treatment with disinfection • 30 mg/l BOD_5 • Fecal coliform - 2.2/100 ml (30-day geometric mean) - 23/100 ml (maximum daily number)							
Oregon	• Level IV - biological treatment, clarification, coagulation, filtration, and disinfection • Total coliform	• Total coliform sampling - 1/day • Turbidity - hourly	• Standby power with capacity to fully operate all essential treatment processes • Redundant treatment					

Table A-5. Unrestricted Recreational Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	- 2.2/100 ml (7-day median) - 23/100 ml (maximum any sample) • Turbidity - 2 NTU (24-hour mean) - 5 NTU (5 percent of time during 24-hour period)		facilities and monitoring equipment to meet required levels of treatment • Alarm devices to provide warning of loss of power and/or failure of process equipment					
Texas	• Type I reclaimed water *Reclaimed water on a 30 day average to have a quality of:* • 5 mg/l BOD_5 or $CBOD_5$ • Turbidity - 3 NTU • Fecal coliform - 20/100 ml (geometric mean) - 75/100 ml (not to exceed in any sample)	• Sampling and analysis twice per week for BOD_5 or $CBOD_5$, turbidity, and fecal coliform						
Utah	• Type I treated wastewater - secondary treatment with filtration, and disinfection • 10 mg/l BOD (monthly average)	• Daily composite sampling required for BOD • Continuous turbidity monitoring prior to	• Alternative disposal option or diversion to storage required if turbidity or chlorine residual requirements				• Impoundments at least 500 feet from any potable water well	

Table A-5. Unrestricted Recreational Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	• Turbidity prior to disinfection - not to exceed 2 NTU (daily average) - not to exceed 5 NTU at any time • Fecal coliform - none detected (weekly median as determined from daily grab samples) - 14/100 ml (not to exceed in any sample) • 1.0 mg/l total residual chlorine after 30 minutes contact time at peak flow • pH 6 - 9	disinfection • Daily monitoring of fecal coliform • Continuous total residual chlorine monitoring • pH monitored continuously or by daily grab samples	not met					
Washington	• Class A - oxidized, coagulated, filtered, and disinfected • Total coliform - 2.2/100 ml (7-day mean) - 23/100 ml (single sample) • 30 mg/l BOD and TSS (monthly	• BOD – 24-hour composite samples collected at least weekly • TSS – 24-hour composite samples collected at least daily • Total coliform and dissolved oxygen	• Warning alarms independent of normal power supply • Back-up power source • Emergency storage: short-term, 1 day; long-term, 20 days • Multiple	• Storage required when no approved alternative disposal system exists • Storage volume established by determining storage period required for duration of a		• May be required • Monitoring will be based on reclaimed water quality and quantity, site-specific soil and hydrogeologic characteristics, and other considerations	• Unlined impoundments - 500 feet between perimeter and any potable water supply well • Lined impoundments - 100 feet between perimeter and	• Nutrient removal to reduce levels of phosphorus and/or nitrogen is recommended to minimize algal growths and maintain acceptable aesthetic conditions

Table A-5. Unrestricted Recreational Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	mean) • Turbidity - 2 NTU (monthly) - 5 NTU (not to exceed at any time) • Minimum chlorine residual of 1 mg/l after a contact time of 30 minutes	- grab samples collected at least daily • Continuous on-line monitoring of turbidity	treatment units or storage or disposal options • Qualified personnel available or on call at all times the irrigation system is operating	10-year storm, using a minimum of 20 years of climatic data • At a minimum, system storage capacity should be the volume equal to 3 times that portion of the average daily flow for which no alternative reuse or disposal system is permitted			any potable water supply well	

Table A-6. Restricted Recreational Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
Arizona	• Class A reclaimed water-secondary treatment, filtration, and disinfection • Chemical feed facilities required to add coagulants or polymers if necessary to meet turbidity criterion • Turbidity - 2 NTU (24 hour average) - 5 NTU (not to exceed at any time) • Fecal coliform - none detectable in 4 of last 7 daily samples - 23/100 ml (single sample maximum)	• Case-by-case basis						
California	• Disinfected secondary-2.2 recycled water-oxidized and disinfected • Total coliform - 2.2/100 ml (7-day median) - 23/100 ml (not to exceed in more than	• Total coliform - sampled at least once daily from the disinfected effluent	• Warning alarms • Back-up power source • Multiple treatment units capable of treating entire flow with one unit not in operation or				• No impoundment of disinfected secondary-2.2 recycled water within 100 feet of any domestic water supply well	• Includes any publicly accessible impoundments at fish hatcheries

Table A-6. Restricted Recreational Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	one sample in any 30-day period)		storage or disposal provisions • Emergency storage or disposal: short-term, 1 day; long-term, 20 days • Sufficient number of qualified personnel					
Colorado	• Oxidized and disinfected • Total coliform - 2.2/100 ml (7-day median)						• 500 feet from impoundment to domestic supply well • 100 feet from impoundment to any irrigation well	
Hawaii	• R-1 water-oxidized, filtered, and disinfected • Fecal coliform – 2.2/100 ml (7-day median) - 23/100 ml (not to exceed in more than one sample in any 30-day period) - 200/100 ml (maximum any one sample) • Inactivation and/or removal	• Daily flow monitoring • Continuous turbidity monitoring prior to and after filtration process • Continuous measuring and recording of chlorine residual • Daily monitoring of fecal coliform • Weekly monitoring of	• Multiple or standby units required of sufficient capacity to enable effective operation with any one unit out of service • Alarm devices required for loss of power, high water levels, failure of pumps or blowers, high head loss on	• 20 days storage required unless it can be demonstrated that another time period is adequate or that no storage is necessary • Storage requirements based on water balance using at least a 30 year record • Reject storage			• Outer edge of impoundment at least 100 feet from any drinking water supply well	

Table A-6. Restricted Recreational Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	of 99.999 percent of the plaque-forming units of F-specific bacteriophage MS2, or polio virus • Effluent turbidity not to exceed 2 NTU • Chemical pretreatment facilities required in all cases where granular media filtration is used; not required for facilities using membrane filtration • Theoretical chlorine contact time of 120 minutes and actual modal contact time of 90 minutes throughout which the chlorine residual is 5 mg/l	BOD_5 and suspended solids	filters, high effluent turbidity, loss of coagulant or polymer feed, and loss of chlorine residual • Standby power source required for treatment plant and distribution pump stations	required with a volume equal to 1 day of flow at the average daily design flow • Emergency system storage not required where an alternate effluent disposal system has been approved				
Nevada	• At a minimum, secondary treatment with disinfection							• Pertains to impoundments where full body contact with

Table A-6. Restricted Recreational Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	• 30 mg/l BOD_5 • Fecal coliform - 2.2/100 ml (30 day geometric mean) - 23/100 ml (maximum daily number)							the treated effluent cannot reasonably be expected
Oregon	• Level III - biological treatment and disinfection • Total coliform - 2.2/100 ml (7-day median) - 23/100 ml (maximum any sample)	• Total coliform sampling - 3/week	• Standby power with capacity to fully operate all essential treatment processes • Redundant treatment facilities and monitoring equipment to meet required levels of treatment • Alarm devices to provide warning of loss of power and/or failure of process equipment					
Texas	• Type II reclaimed water *Reclaimed water on a 30-day average to have a quality of:* • 30 mg/l BOD_5 with treatment using pond	• Sampling and analysis once per week for BOD_5 or $CBOD_5$ and fecal coliform						

Table A-6. Restricted Recreational Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	system • 20 mg/l BOD_5 or 15 mg/l $CBOD_5$ with treatment other than pond system • Fecal coliform - 200/100 ml (geometric mean) - 800/100 ml (not to exceed in any sample)							
Utah	• Type II treated wastewater - secondary treatment with disinfection • 25 mg/l BOD (monthly average) • TSS - 25 mg/l (monthly average) - 35 mg/l (weekly mean) • Fecal coliform - 200/100 ml (weekly median) – 800/100 ml (not to exceed in any sample) • pH 6 - 9	• Weekly composite sampling required for BOD • Daily composite sampling required for TSS • Daily monitoring of fecal coliform • pH monitored continuously or by daily grab samples	• Alternative disposal option or diversion to storage required in case quality requirements not met				• Impoundments at least 500 feet from any potable water well	
Washington	• Class B - oxidized and disinfected • Total coliform	• BOD – 24-hour composite samples collected at	• Warning alarms independent of normal power	• Storage required when no approved alternative		• May be required • Monitoring program will be	• Unlined impoundments - 500 feet between	• Nutrient removal to reduce levels of phosphorus

Table A-6. Restricted Recreational Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	- 2.2/100 ml (7-day mean) - 23/100 ml (single sample) • 30 mg/l BOD and TSS (monthly mean) • Turbidity - 2 NTU (monthly) - 5 NTU (not to exceed at any time) • Minimum chlorine residual of 1 mg/l after a contact time of 30 minutes	least weekly • TSS – 24-hour composite samples collected at least daily • Total coliform and dissolved oxygen - grab samples collected at least daily • Continuous on-line monitoring of turbidity	supply • Back-up power source • Emergency storage: short-term, 1 day; long-term, 20 days • Multiple treatment units or storage or disposal options • Qualified personnel available or on call at all times the irrigation system is operating	disposal system exists • Storage volume established by determining storage period required for duration of a 10-year storm, using a minimum of 20 years of climatic data • At a minimum, system storage capacity should be the volume equal to three times that portion of the average daily flow for which no alternative reuse or disposal system is permitted		based on reclaimed water quality and quantity, site specific soil and hydrogeologic characteristics, and other considerations	perimeter and any potable water supply well • Lined impoundments - 100 feet between perimeter and any potable water supply well	and/or nitrogen is recommended to minimize algal growths and maintain acceptable aesthetic conditions

Table A-7. Environmental – Wetlands

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
Florida	*Treatment wetland:* • Secondary treatment with nitrification • 20 mg/l $CBOD_5$ and TSS (annual average) • 2 mg/l total ammonia (monthly average) *Receiving wetland:* • 5 mg/l $CBOD_5$ and TSS (annual average) • 3 mg/l total nitrogen (annual average) • 1 mg/l total phosphorus (annual average) • 2 mg/l total ammonia (monthly average)			• Reclaimed water shall be stored in a holding pond • The holding pond will have sufficient storage capacity to assure retention of reclaimed water that has not been treated to an acceptable quality for discharge to a treatment or receiving wetland • At a minimum, this capacity will be the volume equal to 1 day of flow at the permitted capacity of the treatment plant	• Maximum annual average hydraulic loading of 2 in/wk except in hydrologically altered wetlands - maximum of 6 in/wk • Treatment wetland - total nitrogen loading rate not to exceed 25 $g/m^2/yr$ - total phosphorus loading rate not to exceed 3 $g/m^2/yr$ • Hydrologically altered wetland - total nitrogen loading rate not to exceed 75 $g/m^2/yr$ - total phosphorus loading rate not to exceed 9 $g/m^2/yr$			• The discharge of reclaimed water to treatment or receiving wetlands shall minimize channelized flow and maximize sheet flow in the wetland, minimize the loss of dissolution of sediments due to erosion or leaching, and not cause adverse effects on endangered or threatened species • Discharge of reclaimed water to wetlands located within Class I surface waters considered reuse for indirect potable purposes
South Dakota	• Pretreatment with stabilization ponds			• Minimum recommended storage capacity in stabilization	• Maximum hydraulic design loading flow through rate on artificial	• A minimum of three wells, one upgradient and two downgradient	• The entire wetland area to be enclosed with a suitable fence to	• Applies to artificial wetland systems • Reviewed on a

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Table A-7. Environmental – Wetlands

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
				pond system of 150 days • Minimum combined storage capacity of 180 days in stabilization ponds and artificial wetland areas	wetlands of 25,000 gal/acre/day	of the site, may be required • At a minimum, parameters to be sampled include temperature, pH, conductivity, nitrate, ammonia, fecal coliform, nitrites, chlorides, TDS, sulfate, and GW elevations	provide public safety, exclude livestock, and discourage trespassing	site-by-site basis
Washington	*Natural and constructed beneficial use wetlands that provide potential human contact, recreational, or educational beneficial uses:* • Class A - oxidized, coagulated, filtered, and disinfected • Total coliform - 2.2/100 ml (7-day mean) - 23/100 ml (single sample) *Natural and constructed beneficial use*	• BOD, TSS, Kjeldahl nitrogen, ammonia-nitrogen, total phosphorus, and metals - 24-hour composite samples collected weekly • Total coliform - grab samples collected at least daily • Continuous flow monitoring	• Warning alarms independent of normal power supply • Back-up power source • Emergency storage: short-term, 1 day; long-term, 20 days • Multiple treatment units or storage or disposal options • Qualified personnel available or on call at all times	• Storage required when no approved alternative disposal system exists • Storage volume established by determining storage period required for duration of a 10-year storm, using a minimum of 20 years of climatic data • At a minimum, system storage capacity should be the	• Not to exceed an additional average annual hydraulic loading rate of 2 cm/day to Category II wetlands and 3 cm/day to Category III and IV wetlands • Maximum annual average hydraulic loading rate to constructed beneficial use wetlands is limited to	• May be required • Groundwater monitoring may be required for a sufficient length of time to determine that the application of reclaimed water will not degrade existing groundwater quality • Depends on parameter concentrations in reclaimed water and the	• Unlined or unsealed wetland - 500 feet between perimeter and any potable water supply well • Lined or sealed wetland - 100 feet between perimeter and any potable water supply well	• Discharge to Category I wetlands or to saltwater dominated wetlands is not permitted • Reclaimed water intended for beneficial reuse may be discharged for streamflow augmentation provided the reclaimed water meets certain requirements

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Table A-7. Environmental – Wetlands

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	wetlands that provide fisheries, or potential human non-contact recreational or educational beneficial uses: • Class B - oxidized and disinfected • Total coliform - 2.2/100 ml (7-day mean) - 23/100 ml (single sample) *Natural wetlands that provide potential non-contact recreational or educational beneficial uses through restricted access* • Class C - oxidized and disinfected • Total coliform - 23/100 ml (7-day mean) - 240/100 ml (single sample) *General compliance requirements:* • 20 mg/l BOD and TSS (average annual basis)		the irrigation system is operating	volume equal to 3 times that portion of the average daily flow for which no alternative reuse or disposal system is permitted	5 cm/day • Hydraulic loading rate determined as the ratio of the average annual flow rate of reclaimed water to the effective wetted area of the wetland	groundwater quality criteria		

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Table A-7. Environmental – Wetlands

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	• 3 mg/l total Kjeldahl nitrogen (average annual basis) • Total ammonia nitrogen not to exceed Washington chronic standards for freshwater • 1 mg/l total phosporus (average annual basis) • Metals not to exceed Washington surface water quality standards							

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Table A-8. Industrial Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
California	*Cooling water that creates a mist:* • Disinfected tertiary recycled water -oxidized, coagulated (not required if membrane filtration is used and/or turbidity requirements are met), filtered, disinfected • Total coliform - 2.2/100 ml (7-day median) - 23/100 ml (not to exceed in more than one sample in any 30-day period) - 240/100 ml (maximum any one sample) • Turbidity requirements for wastewater that has been coagulated and passed through natural undisturbed soils or a bed of filter media - maximum average of 2 NTU within a 24-hour period - not to exceed 5 NTU more	*Cooling water that creates a mist:* • Total coliform - sampled at least once daily from the disinfected effluent • Turbidity - continuously sampled following filtration *Cooling water that does not create a mist:* • Total coliform - sampled at least once daily from the disinfected effluent	• Warning alarms • Back-up power source • Multiple treatment units capable of treating entire flow with one unit not in operation or storage or disposal provisions • Emergency storage or disposal: short-term, 1 day; long-term, 20 days • Sufficient number of qualified personnel					• Whenever a cooling system, using recycled water in conjunction with an air conditioning facility, uses a cooling tower or otherwise creates a mist that could come into contact with employees or members of the public, the cooling system shall comply with the following: - a drift eliminator shall be used whenever the cooling system is in operation - a chlorine, or other biocide, shall be used to treat the cooling system recirculating water to minimize the growth of *Legionella* and other micro-organisms • Reclaimed water can also

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Table A-8. Industrial Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	than 5 percent of the time within a 24-hour period - maximum of 10 NTU at any time • Turbidity requirements for wastewater passed through membrane - not to exceed 0.2 NTU more than 5 percent of the time within a 24-hour period - maximum of 0.5 NTU at any time *Cooling water that does not create a mist:* • Disinfected secondary-23 recycled water-oxidized and disinfected • Total coliform - 23/100 ml (7-day median) - 240/100 ml (not to exceed in more than one sample in any 30-day period)							be used for industrial boiler feed and industrial process water
Florida	*Once-through cooling water and*	*Once-through cooling water,*	*Open cooling water tower*	*Once-through cooling water,*			*Once-through cooling water,*	• Allows use of reclaimed

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Table A-8. Industrial Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	process water at wastewater treatment plants: • Secondary treatment • 20 mg/l $CBOD_5$ and TSS (annual average) • 30 mg/l $CBOD_5$ and TSS (monthly average) • 45 mg/l $CBOD_5$ and TSS (weekly average) • 60 mg/l $CBOD_5$ and TSS (single sample) • pH 6 - 8.5 *Wash water or process water:* • Secondary treatment and basic disinfection • 20 mg/l $CBOD_5$ and TSS (annual average) • 30 mg/l $CBOD_5$ and TSS (monthly average) • 45 mg/l $CBOD_5$ and TSS (weekly average) • 60 mg/l $CBOD_5$ and TSS	*wash water or process water:* • Parameters to be monitored and sampling frequency to be identified in wastewater facility permit • Minimum schedule for sampling and testing based on system capacity established for flow, pH, chlorine residual, dissolved oxygen, suspended solids, $CBOD_5$, nutrients, and fecal coliform • Primary and secondary drinking water standards to be monitored by facilities $\geq$ 100,000 gpd *Open cooling water tower applications:* • Parameters to be monitored and sampling frequency to be identified in wastewater	*applications:* • Class I reliability - requires multiple or back-up treatment units and a secondary power source • Minimum reject storage capacity equal to 1 day flow at the average daily design flow of the treatment plant or the average daily permitted flow of the reuse system, whichever is less • Minimum system size of 0.1 mgd (not required for toilet flushing and fire protection uses) • Staffing - 24 hrs/day, 7 days/wk or 6 hrs/day, 7 days/wk with diversion of reclaimed water to reuse system only	*wash water or process water:* • System storage ponds not required *Open cooling water tower applications:* • At a minimum, system storage capacity shall be the volume equal to 3 times the portion of the average daily flow for which no alternative reuse or disposal system is permitted • Water balance required with volume of storage based on a 10-year recurrence interval and a minimum of 20 years of climatic data • Not required if alternative system is incorporated into the system design to ensure continuous facility			*wash water or process water:* • Setback distances from the industrial process or activity to the site property line not required *Open cooling water tower applications:* • None required if the reclaimed water has received secondary treatment with filtration and high-level disinfection • 300-foot setback distance provided from the cooling tower to the site property lines if reclaimed water has received secondary treatment and basic disinfection	water for cooling water, wash water, or process water at industrial facilities • Reclaimed water that has not been disinfected may be used for once-through cooling purposes at industrial facilities if the reclaimed water has received at least secondary treatment, is conveyed and used in closed systems which are not open to the atmosphere, and is returned to the domestic wastewater treatment facility • Reclaimed water that has received secondary treatment and basic disinfection

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Table A-8. Industrial Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	(single sample) • Chlorine residual of 0.5 mg/l maintained after at least 15 minutes contact time at peak flow • Fecal coliform - 200/100 ml (annual average) - 200/100 ml (monthly geometric mean) - 400/100 ml (not to exceed in more than 10 percent of samples in a 30-day period) - 800/100 ml (single sample) • pH 6 - 8.5 • Limitations to be met after disinfection *Open cooling water tower applications:* • Secondary treatment with filtration and high-level disinfection • Chemical feed facilities to be provided • 20 mg/l $CBOD_5$	facility permit • Minimum schedule for sampling and testing based on system capacity established for flow, pH, chlorine residual, dissolved oxygen, suspended solids, $CBOD_5$, nutrients, and fecal coliform • Continuous on-line monitoring of turbidity prior to disinfection • Continuous on-line monitoring of total chlorine residual or residual concentrations of other disinfectants • Monitoring for *Giardia* and *Cryptosporidium* - sampling one time during each 2 year period - samples to be taken immediately	during periods of operator presence	operation				can be used in open cooling towers if a 300-foot setback distance is provided to the property line, the cooling tower is designed and operated to minimize aerosol drift to areas beyond the site property line that are accessible to the public, and biological growth is controlled

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Table A-8. Industrial Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	(annual average) • 5 mg/l TSS (single sample) to be met after filtration and prior to disinfection • Total chlorine residual of at least 1 mg/l after a minimum acceptable contact time of 15 minutes at peak hourly flow • Fecal coliform - over 30-day period, 75 percent of samples below detection limits - 25/100 ml (single sample) • pH 6 - 8.5 • Limitations to be met after disinfection	following disinfection process • Primary and secondary drinking water standards to be monitored by facilities ≥ 100,000 gpd						
Hawaii	*Cooling water that emits vapor or droplets or an industrial process with exposure to workers:* • R-1 water-oxidized, filtered, and disinfected	• Daily flow monitoring • Continuous turbidity monitoring prior to and after filtration process • Continuous measuring and	• Multiple or standby units required of sufficient capacity to enable effective operation with any one unit out of service	• 20 days storage required unless it can be demonstrated that another time period is adequate or that no storage				• Can be used for industrial cooling in a system that does not have a cooling tower, evaporative condenser, or other feature

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Table A-8. Industrial Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	• Fecal coliform - 2.2/100 ml (7-day median) - 23/100 ml (not to exceed in more than one sample in any 30-day period) - 200/100 ml (maximum any one sample) • Inactivation and/or removal of 99.999 percent of the plaque-forming units of F-specific bacteriophage MS2, or polio virus • Effluent turbidity not to exceed 2 NTU • Chemical pretreatment facilities required in all cases where granular media filtration is used; not required for facilities using membrane filtration • Theoretical chlorine contact time of 120 minutes and actual modal	recording of chlorine residual • Daily monitoring of fecal coliform • Weekly monitoring of BOD_5 and suspended solids	• Alarm devices required for loss of power, high water levels, failure of pumps or blowers, high head loss on filters, high effluent turbidity, loss of coagulant or polymer feed, and loss of chlorine residual • Standby power source required for treatment plant and distribution pump stations	is necessary • Storage requirements based on water balance using at least a 30 year record • Reject storage required with a volume equal to 1 day of flow at the average daily design flow • Emergency system storage not required where an alternate effluent disposal system has been approved				that emits vapor or droplets to the open atmosphere or to air to be passed into a building or other enclosure occupied by a person • Can be used as supply for addition to a cooling system or air conditioning system with a cooling tower, evaporative condenser, or other feature that emits vapor or droplets to the open atmosphere or to air to be passed into a building or other enclosure occupied by a person, when all of the following occurs: a high efficiency drift reducer is used and the

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Table A-8. Industrial Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	contact time of 90 minutes throughout which the chlorine residual is 5 mg/l *Cooling water that does not emit vapor or droplets, an industrial process without exposure to workers or industrial boiler feed:* • R-2 water-oxidized and disinfected • Fecal coliform - 23/100 ml (7-day median) - 200/100 ml (not to exceed in more than one sample in any 30-day period) • Theoretical chlorine contact time of 15 minutes and actual modal contact time of 10 minutes throughout which the chlorine residual is 0.5 mg/l							system is maintained to avoid greater rate of generation of drift than that which a high efficiency drift reducer is associated; a continuous biocide residual, sufficient to prevent bacterial population from exceeding 10,000/ml is maintained in circulating water; and the system is inspected by an operator capable of determining compliance at least once per day

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Table A-8. Industrial Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
New Jersey	• Requires a case-by-case review • Fecal coliform - 200/100 ml (monthly average, geometric mean) - 400/100 ml (maximum any one sample • Minimum chlorine residual - 1.0 mg/l after 15 minute contact at peak hourly flow • TSS requirements applies to the existing treatment requirements as specified in the NJPDES permit for the discharge • Secondary	• Submission of Standard Operations Procedure that ensures proper disinfection to the required level of 1.0 mg/l • Annual usage report		• Not required when another permitted reuse system or effluent disposal system is incorporated into the system design • If system storage ponds are used, they do not have to be lined • Reject storage ponds shall be lined or sealed to prevent measurable seepage • Existing or proposed ponds (such as golf course ponds) are appropriate for storage of reuse water if the ability of the ponds to function as stormwater management systems is not impaired				• Worker contact with reclaimed water shall be minimized • Windblown spray shall not reach areas accessible to the public • Secondary treatment, for the purpose of the manual, refers to the existing treatment requirements in the NJPDES permit, not including the additional reclaimed water for beneficial reuse treatment requirements
North Carolina	• Tertiary quality effluent (filtered or equivalent) • TSS	• Continuous on-line monitoring and recording for	• All essential treatment units to be provided in duplicate	• Determined using a mass water balance based upon a				• Includes reclaimed water used for process water

(1) Distances are from edge of wetted perimeter unless otherwise noted.

Table A-8. Industrial Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	- 5 mg/l (monthly average) - 10 mg/l (daily maximum) • Fecal coliform - 14/100 ml (monthly geometric mean) - 25/100 ml (daily maximum) • BOD_5 - 10 mg/l (monthly average) - 15 mg/l (daily maximum) • NH_3 - 4 mg/l (monthly average) - 6 mg/l (daily maximum) • Turbidity not to exceed 10 NTU at any time	turbidity or particle count and flow prior to discharge	• Five-day side stream detention pond required for effluent exceeding turbidity or fecal coliform limits • Automatically activated standby power source to be provided • Certified operator on call 24 hrs/day with a grade level equivalent to or greater than the facility classification	recent 25-year period using monthly average precipitation data, potential evapotrans-piration,data, and soil drainage data • No storage facilities required if it can be demonstrated that other permitted disposal options are available				and cooling water purposes
Oregon	• Level II is minimum treatment for industrial or commercial uses - biological treatment and disinfection • Total coliform - 240/100 ml (2 consecutive samples)	• Total coliform sampling - Once a week	• Standby power with capacity to fully operate all essential treatment processes • Redundant treatment facilities and monitoring equipment to meet required levels of					• Use of reclaimed water in evaporative cooling systems will be approved only if the user can demonstrate that aerosols will not present a hazard to public health

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Table A-8. Industrial Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	- 23/100 ml (7-day median)		treatment • Alarm devices to provide warning of loss of power and/or failure of process equipment					
Texas	*Cooling tower makeup water* • Type II reclaimed water *Reclaimed water on a 3- day average to have a quality of:* • 30 mg/l BOD_5 with treatment using pond system • 20 mg/l BOD_5 or 15 mg/l $CBOD_5$ with treatment other than pond system • Fecal coliform - 200/100 ml (geometric mean) - 800/100 ml (not to exceed in any sample)	• Sampling and analysis once per week for BOD_5 or $CBOD_5$ and fecal coliform						• Use for cooling towers which produce significant aerosols adjacent to public access areas may have special requirements

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Table A-8. Industrial Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
Utah	*Cooling water:* • Type II treated wastewater - secondary treatment with disinfection • 25 mg/l BOD (monthly average) • TSS - 25 mg/l (monthly average) - 35 mg/l (weekly average) • Fecal coliform - 200/100 ml (weekly median) - 800/100 ml (not to exceed in any sample) • pH 6 - 9	• Weekly composite sampling required for BOD • Daily composite sampling required for TSS • Daily monitoring of fecal coliform • pH monitored continuously or by daily grab samples	• Alternative disposal option or diversion to storage required in case quality requirements not met					• Use for cooling towers which produce aerosols in populated areas may have special restrictions imposed
Washington	*Industrial boiler feed, industrial cooling water where aerosols or other mists are not created, and industrial process water with no exposure to workers:* • Class C - oxidized and disinfected • Total coliform - 23/100 ml (7-day mean)	• BOD – 24-hour composite samples collected at least weekly • TSS – 24-hour composite samples collected at least daily • Total coliform and dissolved oxygen - grab samples collected at	• Warning alarms independent of normal power supply • Back-up power source • Emergency storage: short-term, 1 day; long-term, 20 days • Multiple treatment units or storage or	• Storage required when no approved alternative disposal system exists • Storage volume established by determining storage period required for duration of a 10-year storm, using a minimum of 20				

(1) Distances are from edge of wetted perimeter unless otherwise noted.

Table A-8. Industrial Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances [1]	Other
	- 240/100 ml (single sample) *Industrial cooling water where aerosols or other mists are created and industrial process water with exposure to workers:* • Class A - oxidized, coagulated, filtered, and disinfected • Total coliform - 2.2/100 ml (7-day mean) - 23/100 ml (single sample) *General compliance requirements:* • 30 mg/l BOD and TSS (monthly mean) • Turbidity - 2 NTU (monthly) - 5 NTU (not to exceed at any time) • Minimum chlorine residual of 1 mg/l after a contact time of 30 minutes	least daily • Continuous on-line monitoring of turbidity	disposal options • Qualified personnel available or on call at all times the irrigation system is operating	years of climatic data • At a minimum, system storage capacity should be equal to 3 times that portion of the average daily flow for which no alternative reuse or disposal system is permitted				

(1) Distances are from edge of wetted perimeter unless otherwise noted.

Table A-9. Groundwater Recharge

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
California	• Determined on a case-by-case basis • Based on all relevant aspects of each project, including the following factors: treatment provided; effluent quality and quantity; spreading area operations; soil characteristics; hydrogeology; residence time and distance to withdrawal							
Florida	*Use of rapid-rate land application systems:* • Secondary treatment and basic disinfection • Fecal coliform - 200/100 ml (annual average) - 200/100 ml (monthly geometric mean) - 400/100 ml (not to exceed	• Continuous on-line monitoring for turbidity before applicaton of the disinfectant • Continuous monitoring for chlorine residual or for residual concentrations of other disinfectants • Treatment facilities designed to	• Class I reliability - requires multiple or backup treatment units and a secondary power source • For treatment facilities required to provide full treatment and disinfection - minimum reject storage	• System storage not required • If system storage is provided, at a minimum, system storage capacity shall be the volume equal to three times the portion of the average daily flow for which no alternative reuse or	• Reasonable assurances must be provided that the hydraulic loading rates used in the design must enable the system to comply with the requirements while meeting applicable groundwater quality	• Required • 1 upgradient well located as close as possible to the site without being affected by the site's discharge (background well) • 1 well at the edge of the zone of discharge down-gradient of the site	• Zones of discharge not to extend closer than 500 feet to a potable water supply well • 1,000 foot setback distance from injection well used for salinity barrier control to potable water supply wells • 500 feet to	• Rapid-rate application systems that result in the collection and discharge of more than 50 percent of the applied reclaimed water will be considered effluent disposal systems • Involves the planned use of

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Table A-9. Groundwater Recharge

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	in more than 10% of samples in a 30 day period) - 800/100 ml (single sample) • 10 mg/l TSS (single sample) prior to discharge to the application/ distribution system for absorption field systems • Nitrate - 12 mg/l as nitrogen *Use of rapid-rate land application systems for projects considered reuse for groundwater recharge under 62-610.525:* • Secondary treatment with filtration and high-level disinfection • Chemical feed facilities to be provided • 5 mg/l TSS (single sample) to be achieved prior to	meet the full treatment and disinfection requirements to sample for TOC and total organic halogen daily, seven days per week • Total coliforms and TSS analyzed daily if treatment facility is required to meet bacteriological requirements of the drinking water standards • Parameters listed as primary drinking water standards that are imposed as reclaimed water limits to be analyzed monthly • Parameters listed as secondary drinking water standards that are imposed	capacity equal to three day's flow at the average daily permitted flow of the treatment plant or the average daily permitted flow of the reuse system, whichever is less • If full treatment and disinfection is not required, the capacity requirement for reject storage shall be reduced to one day's flow • Reject storage will not be required if another permitted reuse system or effluent disposal system is capable of discharging the reject water in accordance with	disposal system is permitted • Water balance required with volume of storage based on a 10-year recurrence interval and a minimum of 20 years of climatic data • Not required if alternative system is incorporated into the system design to ensure continuous facility operation	standards • A groundwater mounding analysis is to be included in the engineering report and should provide reasonable assurances that the proposed project will function as intended and will not result in excessive mounding of groundwaters, increases in surface water elevations, property damage or interference with reasonable use of property within the affected area	(compliance well) • 1 well downgradient from the site and within the zone of discharge (intermediate well) • 1 well located adjacent to unlined storage ponds or lakes • Other wells may be required depending on site-specific criteria • Quarterly monitoring required for water level, nitrate, total dissolved solids, arsenic, cadmium, chloride, chromium, lead, fecal coliform, pH and sulfate • Monitoring may be required for additional	potable water supply wells that are existing or have been approved; Class I surface waters; or Class II surface waters • Setback distance to Class I and Class II surface waters reduced to 100 feet if high-level disinfection is provided • 100 feet to buildings not part of the treatment facility, utilities system or municipal operations • 100 feet to site property line • Some setback distances may be reduced if certain treatment requirements are met and assurances	reclaimed water to augment Class F-1, G-1, or G-II groundwaters identified for potable water use and defined as groundwater recharge in regulations • Types of groundwater recharge systems include injection of reclaimed water into Class F-1, G-1, or G-II groundwaters, specific rapid-rate land application systems, use of reclaimed water to create barriers to the landward or upward migration of salt water within Class F-1, G-1, or G-II

(1) Distances are from edge of wetted perimeter unless otherwise noted.

Table A-9. Groundwater Recharge

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	disinfection • Total nitrogen - 10 mg/l (maximum annual average) • Primary (except asbestos and bacteriological parameters) and secondary drinking water standards must be met • pH to fall within range established in secondary drinking water standards *Groundwater recharge by injection of Class G-1 and F-1 groundwaters and Class G-II groundwaters containing 3000 mg/l or less of TDS:* • Secondary treatment with filtration and high-level disinfection • Chemical feed facilities to be provided	as reclaimed water limits to be analyzed quarterly • pH - daily • Except for total coliforms and pH, 24-hour composite samples to be used for parameters listed as primary or secondary drinking water standards • Unregulated organic contaminants to be sampled annually for some types of projects • Monitoring for *Giardia* and *Cryptosporidium* required quarterly or one time during each two-year period depending on type of project • Parameters to be monitored and sampling	requirements • Minimum system size of 0.1 MGD • Staffing - 24 hrs/day, 7 days/wk for systems required to provide full treatment and disinfection - reduced staffing requirement to 6 hrs/day, 7 days/wk may be approved for systems not required to provide full treatment with diversion of reclaimed water to reuse system only during periods of operator presence and other provisions for increased reliability			parameters based on site specific conditions and groundwater quality	are provided	groundwaters and discharge to surface waters which are directly connected to Class F-1, G-I or G-II groundwaters • Public notification and public hearing requirements • Pilot testing is required for all projects that are required to provide full treatment and disinfection

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Table A-9. Groundwater Recharge

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	• 5 mg/l TSS (single sample) to be achieved prior to disinfection • Total nitrogen - 10 mg/l (maximum annual average) • Primary (except asbestos) and secondary drinking water standards must be met • pH to fall within range established in secondary drinking water standards • TOC - 3 mg/l (monthly average) - 5 mg/l (single sample) • Total organic halogen (TOX) - 0.2 mg/l (monthly average) - 0.3 mg/l (single sample) • Alternative TOC and TOX limitations may	frequency to be identified in wastewater facility permit • Minimum schedule for sampling and testing based on system capacity						

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Table A-9. Groundwater Recharge

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	be approved if certain conditions are met *Groundwater recharge by injection of Class G-II groundwaters containing greater than 3000 mg/l of TDS:* • Same treatment and water quality requirements as above except TOC, TOX and secondary drinking water requirements do not apply • Limitations to be met before injection to groundwater							
Hawaii	• Determined on a case-by-case basis • Recycled water used for groundwater recharge by surface or subsurface application shall be at all	• Determined on a case-by-case basis	• Multiple or standby units required of sufficient capacity to enable effective operation with any one unit out of service • Alarm devices	• 20 days storage required unless it can be demonstrated that another time period is adequate or that no storage is necessary		• Required • Groundwater monitoring system may consist of a number of lysimeters and/or monitoring wells depending on		• Department of Health evaluation of proposed groundwater recharge projects and expansion of existing projects made on an

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Table A-9. Groundwater Recharge

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	times of a quality that fully protects public health • Projects that are over an aquifer classified as nonpotable, where the design monthly (deep) percolation rate (DMPR) is greater than 20 percent of the maximum monthly application rate minus the DMPR, will be designated as a recharge project • Projects that are over an aquifer classified as potable, where the application rates exceed the consumptive evapotranspiration of the vegetative cover, will be designated as a		required for loss of power, high water levels, failure of pumps or blowers, high head loss on filters, high effluent turbidity, loss of coagulant or polymer feed, and loss of chlorine residual • Standby power source required for treatment plant and distribution pump stations	• Storage requirements based on water balance using at least a 30-year record • Reject storage required with a volume equal to 1 day of flow at the average daily design flow • Emergency system storage not required where an alternate effluent disposal system has been approved		site size, site characteristics, location, method of discharge and other appropriate considerations • One well upgradient and two wells downgradient for project sites 500 acres or more • One well within the wetted field area for each project whose surface area is greater than or equal to 1500 acres • One lysimeter per 200 acres • One lysimeter for project sites that have greater than 40 but less than 200 acres • Additional lysimeters may be necessary to address concerns of public health or		individual case basis where the use of reclaimed water involves a potential risk to public health • Evaluation based on all relevant aspects of each project including treatment provided, effluent quality and quantity, effluent or application spreading area operation, soil characteristics, hydrogeology, residence time, and distance to withdrawal • A public hearing or a public referendum is required for the DOH to review a request to augment a potable water supply by recharging the potable water

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Table A-9. Groundwater Recharge

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	recharge project					environmental protection as related to variable characteristics of the subsurface or of the operations of the project		supply aquifer with recycled water
Massachusetts	• Secondary • Filtration (possibly) • Disinfection • pH 6 - 9 • BOD - less than 10 mg/l or 30 mg/l • Turbidity - less than 2 NTU or 5 NTU • Fecal coliform - median of no detectable colonies/100 ml over continuous, running 7 day sampling periods, not to exceed 14/100 ml or 200/100 ml • TSS - 5 mg/l or 10 mg/l • Total nitrogen - less than 10 mg/l	• pH - weekly or daily • BOD - weekly • Turbidity - continuous • Fecal coliform - daily or twice per week • Metals - quarterly • TSS - weekly or twice per week • Nitrogen - once or twice per week • MS-2 phage - quarterly • Total culturable viruses - quarterly • Variable testing requirements • UV intensity or chlorine residual - daily	• EPA Class I Reliability standards may be required • Two independent and separate sources of power • Unit redundancy • Additional storage	• Immediate, permitted discharge alternatives are required for emergency situations		*A groundwater monitoring plan is required and must accomplish the following goals:* • Evaluates upgradient (background) groundwater quality • Evaluates the performance of land use components that are considered part of the treatment process • Evaluates the overall impact of the project on local groundwater quality • Acts as an early warning	• No wastewater discharges will be permitted in the Zone I of any public water supply well defined as the area encompassing a maximum 400-foot radius around the wellhead (assuming a greater than 100,000 gpd withdrawal rate) • Discharging to Zone IIs, defined as the entire extent of the aquifer deposits which could fall within and upgradient from the production	• Refers to discharges into aquifer recharge areas as defined by Zone II boundaries of community water systems and groundwater discharges that will recharge reservoirs or tributaries to reservoirs • New treatment plants located in approved Zone IIs with less than a two year groundwater travel time to the public water supply well must treat to the more

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Table A-9. Groundwater Recharge

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	• Class I Groundwater Permit Standards (SDWA Drinking Water Standards)					system between the discharge and sensitive receptors	well's capture zone based on the predicted drawdown after 180-day drought conditions at the approved pumping rate, will be permitted in circumstances where it is necessary to replenish streamflow, enhance the productivity and capacity of an aquifer and/or improve upon or mitigate poor existing environmental conditions	rigorous of the two standards described • Existing treatment plants that can demonstrate four or five feet of separation and where the well has not shown any evidence of water quality degradation may maintain the lesser standard
Washington	*Nonpotable aquifer recharge:* • Class A - oxidized, coagulated, filtered and disinfected • Total coliform - 2.2/100 ml (7-day median) - 23/100 ml (single sample)	• Point of compliance is the point of direct recharge of reclaimed water into the underground • BOD – 24-hour composite samples collected at	• Warning alarms independent of normal power supply • Back-up power source • Emergency storage: short-term, 1 day; long-term,	• Storage required when no approved alternative disposal system exists • Storage volume established by determining storage period required for		• Will be required and based on reclaimed water quality and quantity, site-specific soil and hydrogeologic characteristics and other considerations	• Reclaimed water withdrawn for nonpotable purposes can be withdrawn at any distance from the point of direct recharge • The minimum horizontal	• Defined as direct recharge to nonpotable or potable groundwater aquifers • Reclaimed water withdrawn for nonpotable purposes can be withdrawn

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Table A-9. Groundwater Recharge

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	• 5 mg/l BOD and TSS (7-day mean) • Turbidity - 2 NTU (monthly mean) - 5 NTU (single sample) • Minimum chlorine residual of 1 mg/l after a contact time of 30 minutes based on peak hourly flow • A chlorine residual of at least 0.5 mg/l to be maintained in the reclaimed water during conveyance to the point of recharge *Potable aquifer recharge:* • Oxidized, coagulated, filtered, reverse-osmosis treated and disinfected • Total coliform - 1/100 ml (7-day median) - 5/100 ml (single sample)	least daily • TSS – 24-hour composite samples collected at least daily • Total coliform - grab samples collected at least daily and at a time when wastewater characteristics are most demanding on the treatment facilities and disinfection procedures • Continuous on-line monitoring of turbidity and chlorine residual *Additional monitoring requirements for potable aquifer recharge:* • TOC - 24-hour composite samples collected at least daily • Primary contaminants (except total	20 days • Multiple treatment units or storage or disposal options • Qualified personnel available or on call at all times the system is operating	duration of a 10-year storm, using a minimum of 20 years of climatic data • At a minimum, system storage capacity should be the volume equal to 3 times that portion of the average daily flow for which no alternative reuse or disposal system is permitted		*Nonpotable aquifer recharge:* • Monitoring wells shall be established on a case-by-case basis • Constituents to be sampled shall be determined on a case-by-case basis • Samples from monitoring wells and their sampling frequency shall be determined on a case-by-case basis *Potable aquifer recharge:* • Monitoring wells, at a minimum, shall be located at points 500 feet and 1,000 feet (plus or minus 10%) along the groundwater flow path from the point of recharge to the nearest point of withdrawal of groundwater	separation distance between the point of direct recharge and withdrawal as a source of drinking water supply shall be 2,000 feet	at any time after direct recharge • Reclaimed water shall be retained underground for a minimum of 12 months prior to being withdrawn as a source of drinking water supply • Project evaluation based on all relevant aspects of each project, including treatment and treatment reliability provided, reclaimed water quality and quantity, use or potential use of groundwater, operation and management of the recharge facilities, soil characteristics, hydrogeology, residence time

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Table A-9. Groundwater Recharge

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	• 5 mg/l BOD and TSS (7 day mean) • Turbidity - 0.1 NTU (monthly mean) - 0.5 NTU (maximum) • Total nitrogen - 10 mg/l as N (annual mean) • TOC - 1.0 mg/l (monthly mean) • Water quality criteria for primary contaminants (except nitrate), secondary contaminants, radionuclides and carcinogens listed in Table 1 in chapter 173-200 WAC and any other maximum contaminant levels pursuant to chapter 246-290 WAC must be met • Minimum chlorine residual of 1 mg/l after a	coliform organisms), secondary contaminants, radionuclides, and carcinogens - 24-hour composite samples collected at least quarterly • Total nitrogen - grab or 24-hour composite samples collected at least weekly				used as a source of drinking water supply • Groundwater shall be sampled for TOC and primary contaminants, secondary contaminants, radionuclides, and carcinogens listed in Table 1 in chapter 173-200 WAC • Samples from monitoring wells shall be collected at least quarterly		of the reclaimed water in the underground prior to withdrawal and distance from the recharge area to nearest point of withdrawal • A pilot plant study shall be performed prior to implementation of direct recharge into a potable groundwater aquifer

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Table A-9. Groundwater Recharge

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	contact time of 30 minutes based on peak hourly flow • A chlorine residual of at least 0.5 mg/l to be maintained in the reclaimed water during conveyance to the point of recharge							

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Table A-10. Indirect Potable Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
California	• Determined on a case-by-case basis • Based on all relevant aspects of each project, including the following factors: treatment provided; effluent quality and quantity; spreading area operations; soil characteristics; hydrogeology; residence time and distance to withdrawal	•	•		•	•	•	
Florida	*Discharge to Class I surface waters and to water contiguous to or tributary to Class I waters (less than 4 hours travel time):* • Secondary treatment with filtration and high-level disinfection • Chemical feed facilities to be provided • 5 mg/l TSS	• Continuous on-line monitoring for turbidity before application of the disinfectant • Continuous monitoring for chlorine residual or for residual concentrations of other disinfectants • Treatment facilities designed to	• Class I reliability - requires multiple or backup treatment units and a secondary power source • For treatment facilities required to provide full treatment and disinfection - minimum reject storage	• System storage not required • If system storage is provided, at a minimum, system storage capacity shall be the volume equal to 3 times the portion of the average daily flow for which no alternative reuse or	• Reasonable assurances must be provided that the hydraulic loading rates used in the design must enable the system to comply with the requirements while meeting applicable surface water and	• Required • 1 upgradient well located as close as possible to the site without being affected by the site's discharge (background well) • 1 well at the edge of the zone of discharge down-gradient of the site	• Outfalls for surface water discharges not to be located within 500 feet of existing or approved potable water intakes within Class I surface waters • Zones of discharge not to extend closer than 500 feet to a potable water	• Involves the planned use of reclaimed water to augment Class F-1, G-1, or G-II groundwaters identified for potable water use and defined as groundwater recharge in regulations • Types of groundwater

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Table A-10. Indirect Potable Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	(single sample) to be achieved prior to disinfection • Total nitrogen - 10 mg/l (maximum annual average) • Primary (except asbestos) and secondary drinking water standards must be met • pH to fall within range established in secondary drinking water standards • TOC - 3 mg/l (monthly average) - 5 mg/l (single sample) *Use of rapid-rate land application systems for projects considered reuse for groundwater recharge under 62-610.525:* • Secondary treatment with filtration and	meet the full treatment and disinfection requirements to sample for TOC and total organic halogen daily, 7 days per week • Total coliforms and TSS analyzed daily if treatment facility is required to meet bacteriological requirements of the drinking water standards • Parameters listed as primary drinking water standards that are imposed as reclaimed water limits to be analyzed monthly • Parameters listed as secondary drinking water standards that are imposed	capacity equal to 3 day's flow at the average daily permitted flow of the treatment plant or the average daily permitted flow of the reuse system, whichever is less • If full treatment and disinfection is not required, the capacity requirement for reject storage shall be reduced to one day's flow • Reject storage will not be required if another permitted reuse system or effluent disposal system is capable of discharging the reject water in accordance with requirements	disposal system is permitted • Water balance required with volume of storage based on a 10-year recurrence interval and a minimum of 20 years of climatic data • Not required if alternative system is incorporated into the system design to ensure continuous facility operation	groundwater quality standards • A groundwater mounding analysis is to be included in the engineering report for projects involving discharges to groundwater and should provide reasonable assurances that the proposed project will function as intended and will not result in excessive mounding of groundwaters, increases in surface water elevations, property damage or interference with reasonable use of property within the affected area	(compliance well) • 1 well downgradient from the site and within the zone of discharge (intermediate well) • 1 well located adjacent to unlined storage ponds or lakes • Other wells may be required depending on site-specific criteria • Quarterly monitoring required for water level, nitrate, total dissolved solids, arsenic, cadmium, chloride, chromium, lead, fecal coliform, pH, and sulfate • Monitoring may be required for additional	supply well • 1,000 foot setback distance from injection well used for salinity barrier control to potable water supply wells *Injection facilities:* • 500 feet to potable water supply wells that are existing or have been approved; Class I surface waters; or Class II surface waters • Setback distance to Class I and Class II surface waters reduced to 100 feet if high-level disinfection is provided • 100 feet to buildings not part of the treatment facility, utilities	recharge systems include injection of reclaimed water into Class F-1, G-1, or G-II groundwaters, specific rapid-rate land application systems, use of reclaimed water to create barriers to the landward or upward migration of salt water within Class F-1, G-1, or G-II groundwaters and discharge to surface waters which are directly connected to Class F-1, G-I or G-II groundwaters • Indirect potable reuse Involves the planned use of reclaimed water to

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Table A-10. Indirect Potable Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	high-level disinfection • Chemical feed facilities to be provided • 5 mg/l TSS (single sample) to be achieved prior to disinfection • Total nitrogen - 10 mg/l (maximum annual average) • Primary (except asbestos and bacteriological parameters) and secondary drinking water standards must be met • pH to fall within range established in secondary drinking water standards *Groundwater recharge by injection of Class G-1 and F-1 groundwaters and Class G-II groundwaters containing 3000 mg/l or less of*	as reclaimed water limits to be analyzed quarterly • pH - daily • Except for total coliforms and pH, 24-hour composite samples to be used for parameters listed as primary or secondary drinking water standards • Unregulated organic contaminants to be sampled annually for some types of projects • Monitoring for *Giardia* and *Cryptosporidium* required quarterly or one time during each 2-year period depending on type of project • Parameters to be monitored and sampling frequency to	• Minimum system size of 0.1 mgd • Staffing - 24 hrs/day, 7 days/wk for systems required to provide full treatment and disinfection - reduced staffing requirement to 6 hrs/day, 7 days/wk may be approved for systems not required to provide full treatment with diversion of reclaimed water to reuse system only during periods of operator presence and other provisions for increased reliability			parameters based on site-specific conditions and groundwater quality	system or municipal operations • 100 feet to site property line • Some setback distances may be reduced if certain treatment requirements are met and assurances are provided	augment surface water resources which are used or will be used for public water supplies and includes discharges to Class I surface waters and discharges to other surface waters which are directly or indirectly connected to Class I surface waters • Public notification and public hearing requirements in place for projects involving surface water discharges and underground injection • Pilot testing is required for all projects that are required to provide full treatment and disinfection

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Table A-10. Indirect Potable Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	TDS: • Same treatment and water quality requirements as discharge to Class I surface waters except additional requirement for total organic halogen must be met • Total organic halogen (TOX) - 0.2 mg/l (monthly average) - 0.3 mg/l (single sample • Alternative TOC and TOX limitations may be approved if certain conditions are met *Groundwater recharge by injection of Class G-II groundwaters containing greater than 3000 mg/l of TDS:* • Same treatment and water quality requirements	be identified in wastewater facility permit • Minimum schedule for sampling and testing based on system capacity						

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Table A-10. Indirect Potable Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	as discharge to Class I surface waters except TOC and secondary drinking water requirements do not apply • Limitations to be met before injection to groundwater or discharge to surface waters							
Hawaii	• Determined on a case-by-case basis • Reclaimed water used for groundwater recharge by surface or subsurface application shall be at all times of a quality that fully protects public health • Projects that are over an aquifer classified as potable, where the application rates exceed the consumptive	• Determined on a case-by-case basis	• Multiple or standby units required of sufficient capacity to enable effective operation with any one unit out of service • Alarm devices required for loss of power, high water levels, failure of pumps or blowers, high head loss on filters, high effluent turbidity, loss of coagulant or polymer feed, and loss of	• 20 days storage required unless it can be demonstrated that another time period is adequate or that no storage is necessary • Storage requirements based on water balance using at least a 30-year record • Reject storage required with a volume equal to 1 day of flow at the average daily design flow		• Required • Groundwater monitoring system may consist of a number of lysimeters and/or monitoring wells depending on site size, site characteristics, location, method of discharge, and other appropriate considerations • One well upgradient and two wells downgradient for project sites		• Department of Health evaluation of proposed groundwater recharge projects and expansion of existing projects made on an individual case basis where the use of recycled water involves a potential risk to public health • Evaluation based on all relevant aspects of each project including

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Table A-10. Indirect Potable Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	evapotranspiration of the vegetative cover, will be designated as a recharge project		chlorine residual • Standby power source required for treatment plant and distribution pump stations	• Emergency system storage not required where an alternate effluent disposal system has been approved		500 acres or more • One well within the wetted field area for each project whose surface area is greater than or equal to 1,500 acres • One lysimeter per 200 acres • One lysimeter for project sites that have greater than 40 but less than 200 acres • Additional lysimeters may be necessary to address concerns of public health or environmental protection as related to variable characteristics of the subsurface or of the operations of the project		treatment provided, effluent quality and quantity, effluent or application spreading area operation, soil characteristics, hydrogeology, residence time, and distance to withdrawal • A public hearing or a public referendum is required for the DOH to review a request to augment a potable water supply by recharging the potable water supply aquifer with recycled water
Massachusetts	• Secondary • Filtration (possibly)	• pH - weekly or daily • BOD - weekly	• EPA Class I Reliability standards may	• Immediate, permitted discharge		*A groundwater monitoring plan is required and*	• No wastewater discharges will be permitted in	• Refers to discharges into aquifer

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Table A-10. Indirect Potable Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	• Disinfection • pH 6 - 9 • BOD - less than 10 mg/l or 30 mg/l • Turbidity - less than 2 NTU or 5 NTU • Fecal coliform - median of no detectable colonies/100 ml over continuous, running 7-day sampling periods, not to exceed 14/100 ml or 200/100 ml • TSS - 5 mg/l or 10 mg/l • Total nitrogen - less than 10 mg/l • Class I Groundwater Permit Standards (SDWA Drinking Water Standards)	• Turbidity - continuous • Fecal coliform - daily or twice per week • Metals - quarterly • TSS - weekly or twice per week • Nitrogen - once or twice per week • MS-2 phage - quarterly • Total culturable viruses - quarterly • Variable testing requirements • UV intensity or chlorine residual - daily	be required • Two independent and separate sources of power • Unit redundancy • Additional storage	alternatives are required for emergency situations		*must accomplish the following goals:* • Evaluates upgradient (background) groundwater quality • Evaluates the performance of land use components that are considered part of the treatment process • Evaluates the overall impact of the project on local groundwater quality • Acts as an early warning system between the discharge and sensitive receptors	the Zone I of any public water supply well defined as the area encompassing a maximum 400-foot radius around the wellhead (assuming a greater than 100,000 gpd withdrawal rate) • Discharging to Zone IIs, defined as the entire extent of the aquifer deposits which could fall within and upgradient from the production well's capture zone based on the predicted drawdown after 180-day drought conditions at the approved pumping rate, will be permitted in circumstances where it is	recharge areas as defined by Zone II boundaries of community water systems and groundwater discharges that will recharge reservoirs or tributaries to reservoirs • New treatment plants located in approved Zone IIs with less than a 2 year groundwater travel time to the public water supply well must treat to the more rigorous of the two standards described • Existing treatment plants that can demonstrate 4 or 5 feet of separation and where the well has not shown any evidence of water quality

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Table A-10. Indirect Potable Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
							necessary to replenish streamflow, enhance the productivity and capacity of an aquifer, and/or improve upon or mitigate poor existing environmental conditions	degradation may maintain the lesser standard
Washington	• Oxidized, coagulated, filtered, reverse-osmosis treated and disinfected • Total coliform - 1/100 ml (7-day median) - 5/100 ml (single sample) • 5 mg/l BOD and TSS (7-day mean) • Turbidity - 0.1 NTU (monthly mean) - 0.5 NTU (maximum) • Total nitrogen - 10 mg/l as N (annual mean) • TOC - 1.0 mg/l	• Point of compliance is the point of direct recharge of reclaimed water into the underground • BOD – 24-hour composite samples collected at least daily • TSS - 24 hour composite samples collected at least daily • Total coliform - grab samples collected at least daily and at a time when wastewater	• Warning alarms independent of normal power supply • Back-up power source • Emergency storage: short-term, 1 day; long-term, 20 days • Multiple treatment units or storage or disposal options • Qualified personnel available or on call at all times the system is operating	• Storage required when no approved alternative disposal system exists • Storage volume established by determining storage period required for duration of a 10-year storm, using a minimum of 20 years of climatic data • At a minimum, system storage capacity should be the volume equal to 3 times that		• Will be required and based on reclaimed water quality and quantity, site specific soil and hydrogeologic characteristics and other considerations • For direct recharge into potable groundwater aquifers, monitoring wells, at a minimum, shall be located at points 500 feet and 1,000 feet (plus or minus	• The minimum horizontal separation distance between the point of direct recharge and withdrawal as a source of drinking water supply shall be 2,000 feet	• Defined as direct recharge to potable groundwater aquifers • Reclaimed water shall be retained underground for a minimum of 12 months prior to being withdrawn as a source of drinking water supply • Project evaluation based on all relevant aspects of each project, including treatment and

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Table A-10. Indirect Potable Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
	(monthly mean) • Water quality criteria for primary contaminants (except nitrate), secondary contaminants, radionuclides and carcinogens listed in Table 1 in Chapter 173-200 WAC and any other maximum contaminant levels pursuant to Chapter 246-290 WAC must be met • Minimum chlorine residual of 1 mg/l after a contact time of 30 minutes based on peak hourly flow • A chlorine residual of at least 0.5 mg/l to be maintained in the reclaimed water during conveyance to the point of recharge	characteristics are most demanding on the treatment facilities and disinfection procedures • Continuous on-line monitoring of turbidity and chlorine residual • TOC - 24-hour composite samples collected at least daily • Primary contaminants (except total coliform organisms), secondary contaminants, radionuclides, and carcinogens - 24-hour composite samples collected at least quarterly • Total nitrogen - grab or 24-hour composite samples		portion of the average daily flow for which no alternative reuse or disposal system is permitted		10 percent) along the groundwater flow path from the point of recharge to the nearest point of withdrawal of groundwater used as a source of drinking water supply • Groundwater shall be sampled for TOC and primary contaminants, secondary contaminants, radionuclides, and carcinogens listed in Table 1 in Chapter 173-200 WAC • Samples from monitoring wells shall be collected at least quarterly		treatment reliability provided, reclaimed water quality and quantity, use or potential use of groundwater, operation and management of the recharge facilities, soil characteristics, hydrogeology, residence time of the reclaimed water in the underground prior to withdrawal and distance from the recharge area to nearest point of withdrawal • A pilot plant study shall be performed prior to implementation of direct recharge into a potable groundwater aquifer

(1) Distances are from edge of wetted perimeter unless otherwise noted.

Table A-10. Indirect Potable Reuse

State	Reclaimed Water Quality and Treatment Requirements	Reclaimed Water Monitoring Requirements	Treatment Facility Reliability	Storage Requirements	Loading Rates	Groundwater Monitoring	Setback Distances	Other
		collected at least weekly						

(1) Distances are from edge of wetted perimeter unless otherwise noted.